DOCUMENT RESUME

ED 196 650 SE 030 962

TITLE	Las Matematicas: Lenguaje Universal. Grados Intermedios, Niveles 4-6. Teacher's Guide II (Mathematics: A Universal Language. Intermediate Grades, Levels 4-6. Teacher's Guide II).
INSTITUTION	Dissemination and Assessment Center for Bilingual Education, Austin, Tex.: Fort Worth Independent School District, Tex. Bilingual Education Program.
SPONS AGENCY	Office of Education (DHEW), Washington, D.C.
PUB DATE	79
NOTE	261p.: For related documents, see SE 030 950-961. Not available in hard copy due to copyright restrictions.
AVAILABLE FROM	Dissemination and Assessment Center for Bilingual Education, 7703 North Lamar Blvd., Austin, TX 78752 ($5.00).
LANGUAGE	English: Spanish
EDRS PRICE	MF01 Plus Postage. PC Not Available from EDRS.
DESCRIPTORS	*Bilingual Education: *Elementary School Mathematics: Elementary Secondary Education: Fractions: Geometry: Mathematics Curriculum: *Mathematics Instruction: Measurement: *Secondary School Mathematics: Spanish Culture: *Spanish Speaking: *Teaching Guides: Teaching Methods
IDENTIFIERS	Bilingual Materials

ABSTRACT

This guide covers the second part of a bilingual, sequential mathematics course. The course integrates culturally relevant situations and illustrations with mathematics to reinforce the student's self-concept and encourage cultural pride. This program may be used as a self-contained continuum, as a supplement to another course of study, for individualized instruction, or in the large-group, traditional classroom. These materials are written in English and Spanish for grades 6-8, but may be used for other grade levels. The guide includes suggestions on grouping, presentations, goal setting, scheduling, a testing center, a mathematics laboratory, assignment of materials, and grading. Also included are an overview, behavioral objectives, a section which explains some mathematical procedures taught in Hispanic countries, and duplication masters and transparency masters. The mathematical topics covered are: multiplication and division of fractions, geometry, measurement, and addition and subtraction of fractions. (Author/MK)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

LAS MATEMÁTICAS: LENGUAJE UNIVERSAL

Grados Intermedios
Niveles 4-6

TEACHER'S GUIDE II

U S DEPARTMENT OF HEALTH.
EDUCATION & WELFARE
NATIONAL INSTITUTE OF
EDUCATION

IS DOCUMENT HAS BEEN REPRO-
UCED EXACTLY AS RECEIVED FROM
E PERSON OR ORGANIZATION ORIGIN-
ING IT POINTS OF VIEW OR OPINIONS
ATED DO NOT NECESSARILY REPRE-
NT OFFICIAL NATIONAL INSTITUTE OF
UCATION POSITION OR POLICY

"PERMISSION TO REPRODUCE THIS
MATERIAL IN MICROFICHE ONLY
HAS BEEN GRANTED BY

Elsa Sanchez-de-la-Vega

TO THE EDUCATIONAL RESOURCES
INFORMATION CENTER (ERIC)."

amado maurício peña, jr. '78 ©

2

aguila volante series
BILINGUAL MATERIALS DEVELOPMENT CENTER

Grados Intermedios

Niveles 4-6

LAS MATEMÁTICAS: LENGUAJE UNIVERSAL

TEACHER'S GUIDE II

Publicado por:

DACBE

Elaborado por:

aguila volante series

ILINGUAL MATERIALS DEVELOPMENT CENTER

Dissemination and Assessment Center
for Bilingual Education
Education Service Center, Region XIII
7703 North Lamar
Austin, Texas 78752

"The project reported herein was performed pursuant to a Grant from the U.S. Office of Education, Department of Health, Education and Welfare. However, the opinions expressed herein do not necessarily reflect the positions or policy of the U.S. Office of Education, and no official endorsement by the U.S. Office of Education should be inferred."

The Dissemination and Assessment Center for Bilingual Education is a special E.S.E.A. bilingual project funded by the U.S. Office of Education through the Education Service Center, Region XIII, DACBE has selected these materials for dissemination, however, the opinions expressed herein do not necessarily reflect its position or policy nor that of Education Service Center, XIII.

This publication was developed and printed with funds provided by the Bilingual Education Act, Title VII of the Elementary and Secondary Education Act of 1965, as amended by Public Law 93.380.

© Fort Worth Independent School District
Fort Worth, Texas
All Rights Reserved
1978

ISBN-89417-580-7

First Printing October 1978
Reprinted 1979

TABLE OF CONTENTS

FOREWORD ix

ACKNOWLEDGEMENTS xi

INTRODUCTION 1

NIVEL 4A: MULTIPLICACIÓN DE FRACCIONES

Overview 15

Behavioral Objectives (Levels 4A, 4B) 16

Contrastive Features 17

Lessons 4A-1, 4A-2, 4A-3 18

What is a Fraction?
Explanation of Numerator and Denominator
Types of Fractions

Lessons 4A-4, 4A-5, 4A-6, 4A-7 23

Equivalent Fractions
More Equivalent Fractions
Identifying Equivalent Fractions
Finding an Equivalent Fraction

Lessons 4A-8. 4A-9. 4A-10 25

Relatively Prime Fractions
Simplifying Proper Fractions by Dividing by GCF
Simplifying Proper Fractions by Substitution

Lessons 4A-11, 4A-12, 4A-13, 4A-14 26

Expressing Mixed Numbers as Improper Fractions
Short Cut for Changing Mixed Numbers to Improper Fractions
Changing Improper Fractions to Mixed Numbers
Short Cut for Changing Improper Fractions to Mixed Numbers

Lesson 4A-15: Multiplication of Fractions 29

Lesson 4A-16: Short Cut to Multiplication - Cancellation 31

Lesson 4A-17: Multiplying Mixed Numbers by Proper Fractions 35

Lesson 4A-18: Multiplying Mixed Numbers 36

Lessons 4A-19, 4A-20 36

- Stated Problems
- Properties

NIVEL 4B: DIVISIÓN DE FRACCIONES

Overview 41

Behavioral Objectives (See Level 4A.) 16

Lessons 4B-1, 4B-2, 4B-3 42

- Complex Fractions
- Reciprocals
- Dividing Complex Fractions

Lessons 4B-4, 4B-5 44

- Rule for Division of Fractions
- Whole Numbers in Division

Lessons 4B-6, 4B-7 45

- Mixed Numbers in Division
- More Division with Mixed Numbers

Lessons 4B-8, 4B-9 46

- Summary of Division of Rational Numbers
- Stated Problems

Answer Keys: Student Booklets, Patterns and Activities, Tests 51

Patterns and Activities 81

Tests 103

NIVEL 5A: GEOMETRÍA: CONJUNTOS DE PUNTOS

Overview 113

Behavioral Objectives (Levels 5A, 5B) 113

Contrastive Features 113

Lesson 5A-1: Sets 114

Lessons 5A-2, 5A-3, 5A-4 118

- Points, Line Segments, and Lines
- Rays and Open Half-Lines
- Planes and Space

Lessons 5A-5, 5A-6, 5A-7 121

- Union of Sets
- Angles
- Intersection of Sets

Lesson 5A-8: Plane Intersection 126

NIVEL 5B: MEDIDA LINEAL, PERÍMETRO Y ÁREA

Overview 131

Behavioral Objectives (See Level 5A.) 113

Lessons 5B-1, 5B-2, 5B-3 131

- Measures and Measurements
- Measuring Line Segments
- Practice in Using the Ruler

Lessons 5B-4, 5B-5 133

- Perimeter
- Perimeter of Rectangles

Lesson 5B-6: Area of Rectangles 136

Lessons 5B-7, 5B-8 138

- Area of Triangles
- Area of Parallelograms

Lesson 5B-9: Stated Problems 140

Answer Keys: Student Booklets, Patterns and Activities, Tests ... 145

Patterns and Activities 167

Tests 181

NIVEL 6A: SUMA DE FRACCIONES

Overview 193

Behavioral Objectives (Levels 6A, 6B) 193

Contrastive Features 193

Lesson 6A-1: Rational Numbers 194

Lessons 6A-2, 6A-3, 6A-4 197

    Addition of Fractions
    Simplifying Mixed Numbers
    Adding Mixed Numbers with Common Denominator

Lessons 6A-5, 6A-6, 6A-7 199

    Finding Common Denominators
    Least Common Denominator
    Shortcut to Adding Fractions with Different Denominators

Lesson 6A-8: Adding Mixed Numbers with Different Denominators . 202

Lesson 6A-9: Stated Problems 203

Lesson 6A-10: Properties 204

NIVEL 6B: RESTA DE FRACCIONES

Overview 209

Behavioral Objectives (See Level 6A.) 193

Lessons 6B-1, 6B-2 209

    Subtracting Fractions with a Common Denominator
    Subtracting Mixed Numbers with a Common Denominator

Lessons 6B-3, 6B-4 211

    Subtracting Fractions with Different Denominators
    Subtracting Mixed Numbers with Different Denominators

Lessons 6B-5, 6B-6 213

Subtracting a Fraction from a Whole Number
Subtracting a Mixed Number from a Whole Number

Lesson 6B-7: Subtracting a Mixed Number from a Mixed Number .. 216

Lesson 6B-8: Mixed Numbers with Special Problems 218

Lesson 6B-9: Stated Problems 219

Answer Keys: Student Booklets, Patterns and Activities, Tests ... 223

Patterns and Activities 249

Tests 263

FOREWORD

The first version of LAS MATEMÁTICAS: LENGUAJE UNIVERSAL was developed, pilot-tested, and edited by the Bilingual Materials Development Center in Fort Worth, Texas. The final copy editing and book design was done by the editorial and graphic-arts staff and freelance consultant artists of the Dissemination and Assessment Center for Bilingual Education. The responsibility of DACBE is to provide publication facilities to all the various bilingual development projects of the National Network for Bilingual Education, and other bilingual programs in the U.S. The distribution of this math program is part of the effort to give greater exposure to the materials produced by the bilingual projects in the United States and to make these materials available to all in the United States and to make these materials available to all interested parties, thus also increasing the communication among groups engaged or interested in bilingual bicultural education.

LAS MATEMÁTICAS: LENGUAJE UNIVERSAL is a sequential course of study encompassing a balance of modern and traditional concepts and skills. It intergrates culturally relevant situations and illustrations with mathematics to reinforce the student's self-concept and encourage cultural pride. This bilingual, highly versatile program may be used as a self-contained continuum, as a supplement to another course of study, for individualized instruction, or in the large group of the traditional classroom. These materials are written in English and Spanish for grades 6-8, but may be used for other grade levels and the items contained are:

Teacher's Guide I -- Levels 1-3
5 Student Booklets -- Levels 1-3
Teacher's Guide II -- Levels 4-6
6 Student Booklets -- Levels 4-6

We would like to acknowledge all the individuals who made valuable contributions to this program. The cover illustration was done by Amado Maurilio Peña, the cover layout design and graphic arts for the Teacher's Guide II by Kathy McElroy-Simmons, and the typing of the manuscript by Eileen Matocha. Without their assistance, the publication of this program would have been impossible.

Your comments and suggestions regarding this product will be appreciated.

Carlos E. Pérez, Director
Dissemination and Assessment
Center for Bilingual Education

ACKNOWLEDGEMENTS

This publication, LAS MATEMÁTICAS: LENGUAJE UNIVERSAL, was developed by the Bilingual Materials Development Center under a Title VII grant awarded to the Fort Worth Independent School District by the United States Office of Education. A comprehensive product evaluation design was utilized in developing the text which is a part of the Águila Volante Series.

In the formative stages the materials were subjected to internal quality checks intended to evaluate validity of content, simplicity of design, correlation of objectives and tests, and relevancy and appropriateness of activities for the intended audience.

A committee of teachers under the direction of Crawford Johnson, Program Director, Secondary Mathematics, for the Fort Worth Independent School District submitted ideas for classroom procedures which were later incorporated into the teacher material. The materials were also submitted to teachers for a design test to ensure their accuracy and relevancy in the classroom. Bill Martínez BMDC evaluator, conducted the testing. Those participating in the design test were Sam Castillo and Raul Manríquez.

A pilot test version was completed and testing was conducted during the 1976-1977 school year in coordination with other centers in the National Network of Centers for Bilingual Education. Selected classrooms in New Mexico, Texas, and Colorado were utilized in evaluating these materials. The data produced by the pilot test was reviewed, and necessary revisions were incorporated into this version.

The authors of this publication, Fay Osborn and Verónica Alvarez, spent many hours researching, writing, and checking the applicability of these materials. The revision team included Roberta Holiday and Luis C. Díaz, Editors; Evelyn Villa O'Dell, Writer; and Laurette P. Thompson, Consultant.

Other Bilingual Materials Development Center personnel involved in the development of this publication included Carlos E. Pérez, Project Director, Jean Thompson and José A. López, Assistant Project Directors; Arturo Peña, Editor; Whitney Graves, David Chapa, and Paulette Shook, Artists; and Luis J. Meza, Media Specialist. Numerous typists were also contributors to the production of this publication.

We express our sincere appreciation to each individual who has contributed to the development of this publication.

INTRODUCTION

THE AGUILA VOLANTE SERIES

The AGUILA VOLANTE mathematics continuum can serve as a basic course of study for students and their teachers in grades 6-8 or can be used to complement other texts. The program provides a balance between modern and traditional mathematics, presenting the structure of a mathematical system, while also emphasizing basic computational skills.

Although the program was designed to fill a void which exists in instructional materials for the monolingual Spanish speaker, it may also be used with native English speakers and with bilingual students.

This bilingual mathematics continuum presents a series of six well-defined levels through which the student advances.

LEVEL 1	Numbers and Numeration
LEVEL 2	
Booklet A	Addition and subtraction of Whole Numbers
Booklet B	Multiplication and Division of Whole Numbers
Booklet C	Factors and Multiples
LEVEL 3	Measurement
LEVEL 4	
Booklet A	Multiplication of Fractions
Booklet B	Division of Fractions
LEVEL 5	
Booklet A	Geometry: Sets of Points
Booklet B	Linear Measure, Perimeter and Area
LEVEL 6	
Booklet A	Addition of Fractions
Booklet B	Subtraction of Fractions

APPROACHES TO THE MATERIAL

The booklets lend themselves readily to individualized and small group instruction; however, at the same time they can be utilized for total classroom instruction. If the teacher finds it necessary to have the class as a whole progress through the mathematics program at the same rate, he will find that these booklets facilitate presentation to such a group. However, it is recommended that the instructional program be based on continuous progress, allowing for differences in students' learning processes and in rates of learning. The flexibility necessary to establish continuous progress can best be assured by the use of team teaching. Team teaching utilizes each teacher's abilities to the highest degree while providing a setting which gives the student opportunities for learning at his highest potential.

STUDENT PLACEMENT WITHIN LEVELS

It is recommended that sixth grade students complete at least Levels 1 - 6 of the continuum. Students of other intermediate grades, depending on their background and needs, may also use the booklets on these levels.

TIME LINE GUIDES

The suggested amount of time needed to complete each booklet is two weeks; however, Booklets 2A, 2B, and 4A are likely to require approximately one additional week.

MANAGEMENT SYSTEMS

Every continuous progress program should include (a) a method for grouping students, (2) frequent sequential presentations, (3) a plan for goal setting for each student, (4) a testing center or area (if staffing permits), and (5) laboratory experiences. The following suggestion may be helpful.

Grouping

ALTERNATIVE 1

At the beginning of the grading period, students have been assigned through office personnel into classes. These classes could remain as advisory classes. As a result, there will be a wide range of levels in the advisory classes. These students need to be regrouped according to levels and scheduled for presentations at least twice a week. Each presentation group should include as few levels as possible. Thus, students will meet with their advisory group three days a week for individual assistance and goal setting, and two days a week will be spent in presentations. This alternative lends itself to Model 1.

ALTERNATIVE 2

Students may be grouped according to levels and assigned to a given teacher for a specific period of time. If this alternative is followed, the teacher is responsible for seeing that each level assigned receives at least two planned sequential presentations per week. This alternative lends itself to Models 2, 3, 4, and 5.

ALTERNATIVE 3

In open space, a presentation schedule should be prepared and each teacher assigned lecture topics. Students may be seated according to levels in open space or they may be seated in advisory groups and scheduled into lectures. This alternative lends itself to Model 4.

Presentations

Since presentations are an essential part of all management models, the mathematics department in each school should develop a presentation schedule, based on the model that has been selected. A time schedule for covering each level should also be included. Teacher assignments for presentations should be made in advance to assure that the teacher has adequate preparation time. Presentations are not necessarily formal lectures. The teacher should present a maximum amount of information in a minimum amount of time and should encourage student participation. A teacher may desire to use filmstrips, slides, tapes, prepared transparencies, films or any othe audio-visual equipment to aid the student in acquiring information. Small group discussions, large group discussions, question/answer periods, and laboratory experiences are good ways of teaching concepts to the students.

Many times the level of the students' comprehension of a concept can be enhanced by watching students work problems at the chalkboard. Students are aided by getting involved physically with such materials as meter sticks, compasses, rulers, and protractors. This gets the students involved in the presentation.

Goal Setting

Since goals are based on the student's ability, each mathematics department should develop a schedule for assignments, based on the ability of the students and adapted to the management model which has been selected. A student's goals may be assigned to him as an individual or as part of a group; they may be given orally or in writing. The teacher should record the student's goal each time goals are set. These records are helpful in assigning future goals and grades. Any combination of the following methods of goal setting may be used.

ALTERNATIVE 1

A student may be assigned to an advisory teacher for the six weeks, the quarter, or the year. The student meets with the teacher one day per week for this purpose. On this day, the teacher reviews the previous week's work and sets goals for the coming week.

ALTERNATIVE 2

At times it may be necessary to set daily goals for students who are not progressing. These students may be given a daily assignment which is turned in or checked for completeness at the end of the period or at regular intervals.

ALTERNATIVE 3

Students may be advised by the classroom teacher if the students are grouped by levels. This means the goal setting would be done by several teachers throughout the year. Each teacher advises the students in the levels assigned to him.

Scheduling

The following suggested models provide some possible ways of utilizing the class time; they can be modified by your staff so that they fit your situation.

MODEL 1

One day of the week, for example, Monday, should be set aside for goal setting, allowing approximately two minutes per student. This leaves Wednesday and Friday free for answering individual questions. Ten to twenty minutes is allowed for each level presentation on Tuesday and Thursday. Time allotments and the number of presentations may vary according to the material being taught. Total team cooperation on the part of teachers is required, since the students of an advisory class are assigned to several teachers and move to different rooms for the presentations.

MODEL 2

One day of the week, for example, Monday, should be set aside for goal setting, allowing approximately two minutes per student. Tuesday through Friday is spent giving both individual help and presentations. Approximately half of the levels should be given presentations on Tuesday and Thursday and the other half on Wednesday and Friday. This would give the teacher approximately half of the class time on these days for individual assistance. The advisory class and the presentation group may be the same or they may be different.

MODEL 3

The teacher is responsible for advising and for making presentations to the same students all week. The teacher could spend twenty minutes of each day answering individual questions. Fifteen minutes could be used for advising. The teacher could divide each class into fifths. One fifth of the students could be advised each day. Advisory class is organized on the basis of levels and advisory day is the same day each week for the student. Twenty-five minutes is reserved for class presentations. In order to keep to a minimum the number of levels assigned to any teacher, it is helpful to reassign advisory groups periodically.

MODEL 4

All goal setting for the week is done on Mondays, with approximately two minutes per pupil allowed. Tuesday through Friday is for individual help and presentations. The student leaves the individual help area and goes to a presentation of ten to fifteen minutes on his level two times a week. In an open space area, one teacher can make four to five presentations per class period and, in an individual classroom, two or three presentations. This model can be utilized best in an open space area which is shared by two or more teachers. In order to keep to a minimum the number of levels assigned to any teacher, it is helpful to reassign advisory groups periodically.

MODEL 5

On the basis of levels, a group of students is assigned to a teacher. The teacher makes presentations to approximately half of the levels on Monday and Wednesday, and the other half on Tuesday and Thursday, giving an assignment at the end of each presentation. Thirty minutes is allowed each day for individual help and for giving assignments to the groups that do not receive a presentation. Some students may work at a faster pace than the one set by the teacher and may test earlier than other students in the group. Friday can be utilized for individual assistance, presentations, tests, or miscellaneous activities. There is no designated advisory day; some students are advised each day.

Testing Center

Any of the following alternatives may be selected for use with any of the five management models.

ALTERNATIVE 1

A testing center may be set up in a separate room, a corner of an open area, a hallway, or wherever space is available. When a teacher is available to staff the center, the teacher may grade, record, and issue new or recycled materials in the center. If the teachers prefer, the tests may be graded and returned to the classroom teacher for recording and issuing of appropriate materials. In order to have a teacher available in the testing center, the students assigned to this teacher must be distributed among the remaining teachers.

ALTERNATIVE 2

A testing center may be set up and staffed with an aide. An aide may grade and record the tests, but a teacher must determine whether the student is ready to move to the next level. The teacher must decide what new material the student should receive.

ALTERNATIVE 3

If it is impossible to have a testing center, students may be tested by the teacher to whom they are assigned. If this is done, it is suggested that a small area of the room be designated as the testing area, in order to make test supervision easier. If testing is done in individual rooms, the teacher is responsible for the grading, recording, and issuing of new materials.

ALTERNATIVE 4

Two departments within a school could share the same testing center. In this case the room being used as a testing center may be used by the mathematics department only certain days per week or the two may share it jointly.

Mathematics Laboratory

A mathematics laboratory can be set up with materials available in the school. These materials could include calculators, computer terminals (if available), filmstrip viewers, tape recorders and/or players, and headsets. Other media available are filmstrips, cassette tapes, filmstrips with cassettes, puzzles, games, and drill and practice sheets. Teachers may supplement these materials with teacher or student-made slides, games, or tapes.

It is an advantage to both teachers and students to have all materials catalogued according to level. Each mathematics department should devise a plan for assigning students to the laboratory.

ALTERNATIVE 1

If space is limited, a testing center and laboratory may be combined. One area should be set up with tables and equipment for the laboratory, and another area should have desks for testing. A teacher or an aide may supervise both areas, Student assistants, if available, may be used in the laboratory area. They may pass out materials, help students get started on machines, teach students how to use calculators, put up materials, and other related jobs.

ALTERNATIVE 2

A laboratory may be set up without a testing center. The above procedure should be followed.

ALTERNATIVE 3

If staffing and space are problems, one room can serve as both a testing center some days and a laboratory on other days. On the testing center days, all equipment should be stored. On laboratory days, the equipment should be placed around the room on tables or desks.

ALTERNATIVE 4

In schools where a separate room is not available for a laboratory, the equipment may be set up in a classroom or distributed among the various classrooms. Plans need to be made far enough in advance so that teachers will have the proper materials and equipment in their rooms set up and ready for use.

ASSIGNMENT OF MATERIALS

Every student should have the option of pretesting on each level. Pretesting determines whether the student progresses to the next level without doing the set of required materials for that given level. It may also help the student see a need for studying this material. Ninety percent (90%) achievement or better should be required in order to progress ot the next level. A pupil may be allowed to work on certain concepts within a level instead of doing the entire level if a pretest indicates that this is feasible.

At the beginning of each level that a pupil is to study, he should be issued a booklet. To help him progress through the level, the teacher, at his own discretion, should make assignments based on the pupil's need. It is not necessary to assign every problem in every exercise. After the student has completed the prescribed learning activities, he is given a posttest. If he does not make a satisfactory grade on the posttest, the teacher should provide him with review materials that will help him learn the concepts he has not understood. These review materials might include the textbooks named on the reference chart, other textbooks, or teacher-made materials. When a student completes the review material, he will be given a second posttest.

GRADING

A record of each student's grades should be kept on a grade card. The mathematics department should develop a consistent method of assigning grades. It is suggested that at least two daily grades should be given each week. One of these grades may be an advisory grade, based on the work the student has completed compared to his goal. The other grade booklet. Daily tests, review, daily exercises, completing of assigned work, and class participation could also serve as a basis for grades. Test grades should be recorded on the grade card. If a student is progressing through a level for the second time, making use of the review materials, this information should be indicated on the grade card. The teacher should make sure that enough grades are on the grade card to justify the grade for the reporting period.

FORMAT OF TEACHER'S EDITION

This book for the teacher is designed to accompany the Levels 4-6 student booklets and to provide the necessary instructions for using them effectively. The teacher should become familiar with the sequence and purpose of each section of this book so that he/she can efficiently locate materials as needed. Sections are as follows:

Overview

The overview to each level gives a general orientation to the scope and purposes of the content covered.

Behavioral Objectives

All the behavioral objectives for the level are listed.

Contrastive Features

This section explains important contrastive features of the mathematics processes taught at the level. In some Hispanic countries (Latin American countries and Spain), a different procedure is followed in some mathematics processes than that usually taught in the United States. These procedures are explained in this section for each level.

The directions given in the exercises of the booklets ask that the students show all his work. This helps the teacher to see whether or not the student really understands the mathematical concepts involved. However, the student who has learned his mathematics in a Hispanic country and who is new to the United States will probably use a different method in working some problems. (The term HISPANIC STUDENT, when used in this section, is given a specialized meaning and identifies such a student.) He may have been taught to do many or all of the calculations mentally, showing little or no work. It is most important that such a student be given full credit for correct answers, even though no work is shown or he has used a different procedure to arrive at the answer. In time he will probably learn the method taught in the classroom. Meanwhile, it is best not to slow his progress in mathematics by confusing him and trying to force him to adjust to a different procedure.

Presentation of Lessons

A recommended procedure is given for each grouping of related lessons. The presentation itself consists of the following divisions:

CONCEPTS: Major mathematical concepts included in the lessons

VOCABULARY: Important mathematical terms which the student needs to know in order to understand the lesson

RESOURCES: List of concrete objects to be used in the presentation, other audio-visual aids, patterns for transparencies, etc.

OPTIONAL RESOURCES: Tapes, filmstrips, etc., which would be useful as supplementary activities

PROCEDURE: Concise instructions to the teacher, step-by-step on how to present and explain to the students the mathematical concepts included in the lessons. Approximately 10 to 15 minutes is required for each presentation unless otherwise indicated.

Answer Keys

Answer keys are provided for the exercises of each student booklet of the level as well as for the M pages.

Patterns and Activities

This section contains patterns for the teacher's use in making either duplicating masters or transparency master. They are numbered in sequence with M meaning MODELO (master of pattern), followed by the level number, dash, and number in sequence. Thus Level 1 masters are numbered M1-1, M1-2, M1-3, etc. The M pages to use with a particular lesson are listed under "Resources" for the lesson. Also included in this section are patterns for reproduction for use in activities described in the Presentation.

Tests

Two tests for the level are included, along with answer keys. The tests may be used either as pretest or posttest, or the teacher may prefer to create tests for the level. Frequent short quizzes are recommended in order to be sure the students are mastering the content as they progress through a level.

FORMAT OF STUDENT BOOKLETS

It will also be helpful for the teacher to be familiar with the design of the student booklets. Each booklet is written in English and Spanish, with corresponding pages facing each other. Student materials are presented in the following sequence:

List of Symbols

The mathematical symbols used in the booklet are listed along with their meanings.

Table of Contents

Series of Lessons

Each lesson is followed by an exercise which provides practice work to help the student develop mathematical skills and understand the concepts taught in the lesson.

Review

Glossary

Mathematical terms are defined in English and Spanish.

Reference Chart

These charts give page numbers of explanations and problems in other textbooks covering the same material. These may be used for supplementary work. They are especially helpful in reteaching a level. A student who has completed his written assignments on a level but has not yet mastered the content can be assigned some of these additional problems. They will provide extra practice work to help him master the concepts covered at a given level.

Scheduling

Model 1

Monday	Tuesday				Wednesday	Thursday				Friday
60 min.	15	10	15	20	60 min.	15	15	15	15	60 min.
Advisory Class with Goal Setting	P_1	P_2 Presentations by Levels	P_3	P_4	Advisory Class with Individual Help	P_1	P_2 Presentations by Levels	P_3	P_4	Advisory Class with Individual Help
Lab	Testing				Testing	Testing				Testing

Model 2

60 min.	10	15	15	20	15	10	15	20	10	15	15	20	15	10	15	10	10
Advisory Class with Goal Setting	P_1	Ind. Help	P_2	Ind. Help	Ind. Help	P_3	P_4	Ind. Help	P_1	Ind. Help	P_2	Ind. Help	Ind. Help	P_3	Ind. Help	P_4	Ind. Help
Lab	Testing/Lab				Testing/Lab				Testing/Lab				Testing/Lab				

Model 3

20	25	15	25	20	15	20	25	15	15	25	20	20	15	20
Ind. Help	P_1 P_2	Adv. Group I	P_3 P_4	Ind. Help	Adv. Group II	Ind. Group	P_1 P_2	Adv. Group III	Adv. Group IV	P_3 P_4	Ind. Help	Ind. Help	Adv. Group V	P P
Testing/Lab			Testing/Lab			Testing/Lab			Testing/Lab			Testing/Lab		

<table>
<tr><th></th><th colspan="2">Monday</th><th colspan="4">Tuesday</th><th colspan="3">Wednesday</th><th colspan="3">Thursday</th><th>Friday</th></tr>
<tr><td></td><td colspan="2">60 min.</td><td colspan="4">60 min.</td><td colspan="3">60 min.</td><td colspan="3">60 min.</td><td>60 min.</td></tr>
<tr><td rowspan="2">Module 4</td><td colspan="2">Advisory Class by Levels with Goal Setting</td><td colspan="4">Advisory Class by Levels with Individual Help and Sequenced Presentations</td><td colspan="3">Advisory Class by Levels with Individual Help and Sequenced Presentations</td><td colspan="3">Advisory Class by Levels with Individual Help and Sequenced Presentations</td><td>Advisory Class by Levels with Individual Help and Sequenced Presentations</td></tr>
<tr><td colspan="2">Testing/Lab</td><td colspan="4">Testing/Lab</td><td colspan="3">Testing/Lab</td><td colspan="3">Testing/Lab</td><td>Testing/Lab</td></tr>
<tr><td></td><td>15</td><td>30</td><td>15</td><td>15</td><td>30</td><td>15</td><td>15</td><td>30</td><td>15</td><td>15</td><td>30</td><td>15</td><td>60 min.</td></tr>
<tr><td rowspan="2">Module 5</td><td>P_1 and Assignment</td><td>Individual help and Assignment for Group 3 & Group 4</td><td>P_2 and Assignment</td><td>P_3 and Assignment</td><td>Individual help & Assignment 1 & for Group 2</td><td>P_4 and Assignment</td><td>P_1 and Assignment</td><td>Individual Help & Assignment for Group 3 & Group 4</td><td>P_2 and Assignment</td><td>P_3 and Assignment</td><td>Individual Help & Assignment for Group 1 & Group 2</td><td>P_4 and Assignment</td><td>Individual Help, Presentations, Testing, Lab, or Miscellaneous</td></tr>
<tr><td colspan="2">Testing/Lab</td><td colspan="4">Testing/Lab</td><td colspan="3">Testing/Lab</td><td colspan="3">Testing/Lab</td><td>Testing/Lab</td></tr>
</table>

P_1 = Presentation for Group 1
P_2 = Presentation for Group 2
P_3 = Presentation for Group 3
P_4 = Presentation for Group 4

MULTIPLICACIÓN DE FRACCIONES

OVERVIEW OF LEVEL 4A

MULTIPLICACIÓN DE FRACCIONES

OVERVIEW OF LEVEL 4A

Level 4A contains basic skills pertaining to fractions, with emphasis on multiplication. Many students were introduced to fractions as early as the third and fourth grades. However, because of differences in their background and ability, it is advisable for the teacher to assume that the students have no knowledge of fractions, and to instruct them in the most basic concepts, giving them a solid foundation. In the presentations which follow, a number of activities with varying levels of difficulty have been included. Due to time limitations, differences in the ability and the progress of the students, and other factors, it is not advisable to use all the activities. Their selection should be made with great care and should vary according to the needs of the students. Suggestions for bulletin boards immediately precede the presentations.

Bulletin boards which display concepts pertaining to fractions serve as useful teaching aids. It would be helpful to display pictures illustrating the following concepts:

1. LAS FRACCIONES SE ENCUENTRAN EN TODAS PARTES/FRACTIONS ARE EVERYWHERE

   A. A display of pictures showing that a fraction represents part of a group
      1. A set of 3 books
      2. A pan of 6 gingerbread cookies
      3. 5 glasses of milk
      4. A hen with 7 chicks
      5. A vase containing 4 identical flowers

   (The students may name different fractions which can be used to represent various parts of the preceding display, such as 1/3, 2/5, 4/7, etc.)

   B. A display of pictures which show that a fraction represents part of a whole

      1. A sliced loaf of bread
      2. The face of a clock
      3. A cake, cut into slices
      4. A bar of soap, divided in half
      5. An apple, cut into slices of the same size

   (The students may name different fractions which can be used to represent various parts of the preceding display.)

II. CUARTOS/FOURTHS

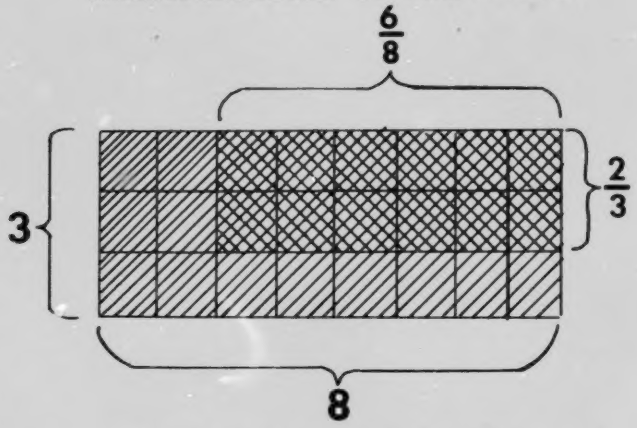
A. A display of pictures which give the students an opportunity to recognize fourths of a whole or of a group

1. A pie, cut into four pieces
2. A bird beside a nest containing 4 eggs
3. A dollar bill, together with 4 quarters
4. A rectangular box, gift wrapped so that the ribbon divides it into four equal parts
5. The face of a clock, with the hands indicating a time which is 15 minutes past the hour

III. MULTIPLICACIÓN DE FRACCIONES, TOCANTE AL ÁREA MULTIPLICATION OF FRACTIONS, INTERPRETED IN TERMS OF AREA

The following display illustrated one way of giving meaning to the multiplication of fractions. The problem 6/8 x 2/3 is illustrated by determining the area of a 6/8 by 2/3 surface enclosed by a rectangle.

MULTIPLICACIÓN DE FRACCIONES
MULTIPLICATION OF FRACTIONS



BEHAVIORAL OBJECTIVES

1. Given four non-negative fractions, the student will write them in simplest form with 75% accuracy.

2. Given four non-negative mixed numbers, the student will change them to improper fractions with 75% accuracy.

3. Given two non-negative improper fractions, the student will change them to mixed numbers with 100% accuracy.

4. Given eight sets of two or three non-negative rational numbers, the student will find the products with 75% accuracy.

5. Given four non-negative rational numbers, the student will name their reciprocals with 75% accuracy.

6. Given six sets of two non-negative rational numbers, the student will find their quotients with 80% accuracy.

7. Given two stated problems involving multiplication and/or division of rational number, the student will solve them with 50% accuracy.

CONTRASTIVE FEATURES

DIVISION

In Hispanic countries, division problems are often set up differently than they are in the United States. Although the division frame ( ) is used, sometimes the colon (:) is used instead of the division sign (÷).

Example:

Method used in the United States	Method used in Hispanic countries
4/5 - 2/3	4/5 - 2/3

DIFFERENCE IN SYSTEM OF MEASUREMENT

The student who has just moved to the United States from a Hispanic country will be used to the metric system of measurement instead of the English system. Refer to the teacher booklet for Level 3 for suggestions on how to acquaint the student with the English units of measure which are used in Booklets 4A and 4B.

TERMINOLOGY

In Spanish, there are two standard terms for the word fraction--fracción and quebrado. Both are equally acceptable, but in order to maintain consistency throughout the booklets, the word fracción will be used as the dominant term. However, the term quebrado has been introduced in parenthesis at the beginning of the booklet as an aid for the student who is more familiar with the term. Seeing the terms side by side will enable him to make the association between the two terms.

WHAT IS A FRACTION?
EXPLANATION OF NUMERATOR AND DENOMINATOR
TYPES OF FRACTIONS

LESSONS 4A-1, 4A-2, 4A-3

Student Booklet p. 3

CONCEPTS

Numerator
Denominator
Fraction
Rational number
Proper fraction
Improper fraction
Mixed numeral

VOCABULARY

denominador	denominator
fracción (quebrado)	fraction
fracción impropia	improper fraction
fracción propia	proper fraction
numerador	numerator
numeral mixto	mixed numeral
número racional	rational number

RESOURCES

1. Sets of math dominoes made from Patterns M4-1 and M4-2
2. Transparency made from Pattern M4-3
3. A collection of items that will lend themselves well to identifying improper fractions and mixed numbers, such as soda or graham crackers, squares of baking chocolate, sticks of butter or margarine pages of stamps or coupons, chocolate candy bars, ribbon, and slices of apples and oranges
4. Portable oven and ingredients for chocolate chip cookies
5. Envelope for each student with a regular polygon drawn on the outside and small pieces representing fractional parts placed inside (Patterns M4-4, M4-5, M4-6)
6. A worksheet for each student made from Pattern M4-7

OPTIONAL RESOURCES

"Original Meaning of Fractional Numbers"
"Meaning of Fractions"
"Language of Fractions"

The preceding filmstrips are from a series of eight filmstrips entitled USING MODERN MATHEMATICS: UNDERSTANDING FRACTIONS and may be purchased from:

Society for Visual Education
1345 Diversey Parkway
Chicago, Illinois 60614

PROCEDURE

Explique brevemente y con claridad los términos numerador, denominador y fracción. Use una transparencia del modelo M4-3 para reforzar la explicación.

Después use alguna de las siguientes actividades para ayudar a los estudiantes a comprender los conceptos de fracción, numerador y denominador.

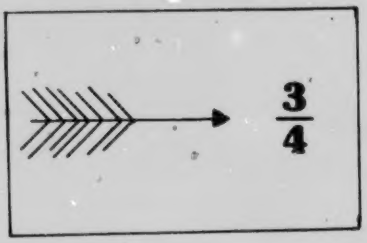
Déle a cada estudiante un juego de dominó hecho del modelo M4-1 o M4-2 que se dan a continuación. Explíqueles que la ficha con la flecha (⋙⟶) es la primera que se tiene que usar. Empiece por buscar la ficha que tiene la ilustración que corresponde con 3/4. Colóquela a la derecha de la primera ficha para que quede la illustración de la primera ficha al lado del 3/4. En esta ficha se encuentra la fracción siguiente que se tiene que parear.

Give a brief but clear and simple explanation of the terms numerator, denominator, and fraction. Use a transparency made from pattern M4-3 to reinforce the explanation.

Then use any of the following activities to help the students understand the concepts of fraction, numerator, and denominator.

Give each student a set of math dominoes made from pattern M4-1 or M4-2, which directly follow. Explain that the domino with the arrow (⟵⋘) is the first one to be used. Begin by finding the domino with the picture that corresponds with 3/4. Place it to the right of the first domino so that the illustration will be beside the 3/4. On this domino will be the next fraction to be matched.

Por ejemplo:

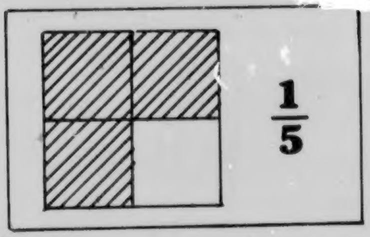


El mismo procedimiento se usa para colocar las fichas restantes. El objeto es continuar el proceso de parear hasta que se usen todas las fichas. El estudiante sabrá que jugó el juego correctamente si la fracción en la última ficha hace pareja con la primera (3/4).

Use RESOURCE NO. 3 dividiendo cada uno de los objetos en varias partes iguales de modo que se usar para representar fracciones. Por ejemplo, divida una barra de Hershey en 7 partes iguales. Haga que un estudiante muestre cuál porción de la barra está representada en 2/7. Pida a otro estudiante que muestre cuál parte de las naranjas está representada en 2 2/3. Usando la misma técnica haga que los estudiantes identifiquen diversos ejemplos de fracciones propias, fracciones impropias y números mixtos.

Una actividad para la clase será hacer galletas de trocitos de chocolate reforzará la comprensión de los estudiantes sobre el concepto de fracción.

For example:



The same procedure will be followed in placing the remaining dominoes. The object is to continue the matching process until all the dominoes are used. The student will know he has played the game correctly if the fraction on the last domino used matches the first one (3/4).

Use RESOURCE NO. 3, separating each of the different objects into several equal parts that can be used to represent fractions. For example, divide the candy bar into seven equal parts. Have a student show how much of the bar represents 2/7. Have another student show what portion of the oranges represents 2 2/3. Use this technique to have the students identify various examples of proper fractions, improper fractions, and mixed numbers.

A class project of making chocolate chip cookies will reinforce the students' understanding of the concept of fraction.

GALLETAS DE TROCITOS DE CHOCOLATE

Caliente el horno a 375°F. (190° C.)

Cierna juntos los siguientes ingredientes y ponga la mezcla a un lado:

1 taza y 2 cucharadas de harina

1/2 cucharadita de bicarbonato de soda

1/2 cucharadita de sal

Combine:

1/2 taza de mantequilla o margarina

1/3 taza de azúcar

1/3 taza de azúcar morena (prieta)

1/2 cucharadita de vainilla

1/4 cucharadita de agua

Bata hasta que la mezcla esté suave; después agregue un huevo, batiéndolo todo bien. Agregue la mezcla de harina, soda y sal a ésta, mezclándolo bien. Añada un paquete (6 oz.) de trocitos de chocolate, revolviéndola con cuidado. Deje caer la masa por cucharaditas en una bandeja (charola) engrasada, dejando 2 pulgadas entre cada una. Horneé a 375°F. de 10 a 12 minutos. Da 50 galletas.

Dé a cada estudiante un sobre con el dibujo de un polígono regular distinto en la parte exterior, y con piezas representando partes fraccionales del

CHOCOLATE CHIP COOKIES

Preheat the oven to 375°F. (190°C.)

Sift together the following ingredients and then set them aside:

1 cup and 2 tablespoons flour

1/2 teaspoon soda

1/2 teaspoon salt

Combine:

1/2 cup butter or shortening

1/3 cup granulated sugar

1/3 cup brown sugar

1/2 teaspoon vanilla

1/4 teaspoon water

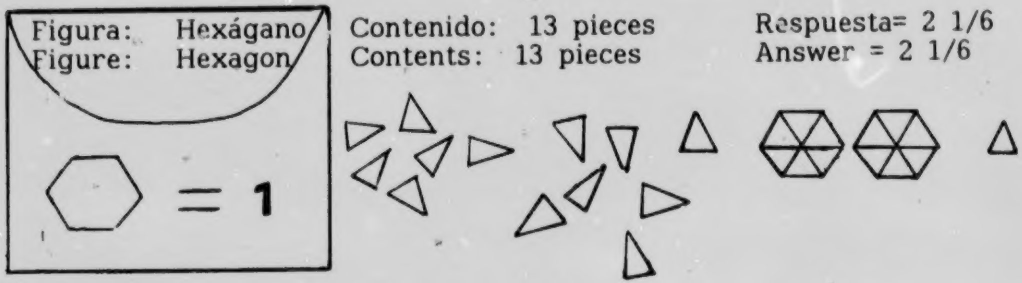
Beat until creamy, then beat in 1 egg. Add the flour mixture and mix well. Stir in one 6 oz. package of chocolate drops. Drop the dough by rounded teaspoonfuls 2 inches apart onto a well-greased baking sheet. Bake at 375°F. for 10-12 minutes. Makes 50 cookies.

Give each student an envelope, each with a different type of regular polygon drawn on the outside and small pieces representing fractional parts on the inside. (Pat-polígono dentro del sobre. (Modelos M4-4, M4-5, M4-6) Haga que cada estudiante, usando todas las piezas, trate de formar tantos polígonos del tipo del dibujo como pueda. el número de polígonos formados y las piezas sobrantes representarán un numeral mixto. El estudiante escribirá este numeral mixto como respuesta.

Después pida a los estudiantes que se intercambien los sobres y que realicen la actividad de nuevo.

terns M4-4, M4-5, M4-6) Have the student use all the pieces to form as many polygons as he can of the type drawn on the envelope. The number of polygons formed, together with the pieces left over, will represent a mixed numeral. The student will write this mixed numeral as the answer.

Have the students trade envelopes and do the activity again.



Haga que los estudiantes practiquen la identificación de fracciones propias, fracciones impropias y numerales mixtos, completando la hoja de trabajo M4-7.

Have each student complete Worksheet M4-7, which provides practice in identifying proper fractions, improper fractions, and mixed numerals.

EQUIVALENT FRACTIONS
MORE EQUIVALENT FRACTIONS
IDENTIFYING EQUIVALENT FRACTIONS
FINDING AN EQUIVALENT FRACTION

LESSONS 4A-4, 4A-5, 4A-6, 4A-7

Student Booklet p. 15

CONCEPT

Equivalent fractions

VOCABULARY

denominador	denominator
fracciones equivalentes	equivalent fractions
identidad	identity
numerador	numerator

RESOURCE

Transparency M4-8

OPTIONAL RESOURCES

Holt Math Tape FT17, time 9:36 minutes
Objective: To write equivalent fractional numerals

Holt Math Tape FF23, time 9:50 minutes
Objective: To compare fractions

Holt Math Tapes 1-8 consist of six casettes for each grade from 1 through 8. (They can be ordered from Holt, Rinehart and Winston Publishers, Box 3323, Grand Central Station, New York, New York 10017.)

PROCEDURE

Para ayudar a los estudiantes a comparender el concepto de fracciones equivalentes, utilice las dos actividades que van a continuación.

In order to help the students understand the concept of equivalent fractions, make use of the following two activities.

Doblamiento de papel

Déle a cada estudiante una hoja de papel. Dígales que la doblen por la mitad y que ensombrezcan una de las partes. Explíqueles que el término 1/2 se aplica a la parte ensombrecida. Pídales que de nuevo doblen las mitades por la mitad. Tendrán entonces cuatro partes iguales, dos de las cuales estarán ensombrecidas. Explíqueles como las expresiones matemáticas 2/4 y 1/2 son equivalentes.

Haga que de nuevo la doblen por la mitad. Tendrán ahora 8 partes iguales, cuatro de las cuales estarán ensombrecidas. (Recuérdeles a los estudiantes que no es que la parte ensombrecida haya crecido, sino que las partes son más pequeñas: 4/8 = 2/4 = 1/2).
Hagales ver que 4/8, 2/4 y 1/2 son iguales porque se refieren a la misma área, y explíqueles que éstas se llaman fracciones equivalentes.

Después de explicar la definición de fracciones equivalentes, ayude a los estudiantes a descubrir el método de determinar una fracción equivalente a una fracción dada. (Tabla de flujo de la Lección 4A-5)

La recta numérica

Utilizando una transparencia del modelo M4-8, pida a los estudiantes que contesten las preguntas de la hoja de trabajo M4-8 y que señalen conjuntos de fracciones equivalentes en la recta numérica.

Paper Folding

Give each student a sheet of paper. Have him fold the paper in half and then shade one of the halves. Point out that the term 1/2 names the shaded region. Have the students fold the halves in half again. There are now four equal parts, two of which are shaded. Explain that 2/4 is just another way of saying 1/2.

Have the students fold the fourths in half. There are now eight equal parts, and four are shaded. (Remind the students that the shaded area has not increased, but rather the parts have become smaller (4/8 = 2/4 = 1/2).

Point out that 4/8, 2/4, and 1/2 are equal because they name the same region, and explain that they are called equivalent fractions.

After explaining the definition of equivalent fractions, help the students discover the method for finding a fraction equivalent to a given fraction. (Flow chart of Lesson 4A-5)

The Number Line

Using a transparency of Pattern M4-8, ask the students the questions on Worksheet M4-8 and have them point out sets of equivalent fractions on the number line.

Después, explíqueles el contenido de las Lecciones 4A-6 y 4A-7.

Then discuss the material in Lessons 4A-6 and 4A-7.

RELATIVELY PRIME FRACTIONS
SIMPLIFYING PROPER FRACTIONS BY DIVIDING BY GCF
SIMPLIFYING PROPER FRACTIONS BY SUBSTITUTION

LESSONS 4A-8, 4A-9, 4A-10

Student Booklet p. 33

CONCEPTS

Relatively prime fractions
Fractions expressed in simplest form

VOCABULARY

forma más simple	simplest form
fracción propia	proper fraction
máximo factor común (MFC)	greatest common factor (G.C.F.)
fracciones primas entre sí	relatively prime fractions

RESOURCE

Transparency M4-9

OPTIONAL RESOURCES

"Fraction Machine," which can be easily made from two sheets of lined paper.
The students can manipulate it to determine several fractions which are equivalent to a given fraction.

Reference: M. Wassemansdorf, "Reducing Fractions Can Be Easy, Maybe Even Fun." ARITHMETIC TEACHER, Feb., 1974, pp. 99-102.

PROCEDURE

Para repasar el concepto de fracciones equivalentes, use el "abanico de fracciones" u otro método que escoja usted. (Vea

Review the meaning of equivalent fractions by using the "fraction machine" or some other method of your choice. (See OPTIONAL RE-

OPTIONAL RESOURCES.) Escriba en la pizarra varios ejemplos de fracciones, tales como 1/2, 2/3, 1/4, 5/6, etc., y haga que los estudiantes busquen todas las fracciones que puedan encontrar equivalentes a las fracciones dadas.

Explíqueles lo que quiere decir una fracción en su forma más simple (Lección 4A-8). Escribiendo varios ejemplos de fracciones, tales como: 15/20, 4/7, 5/9, 6/16, 6/9 y 4/5, pida a los estudiantes que digan cuáles están expresadas en su forma más simple. Mediante ejemplos, muéstreles a los estudiantes cómo reducir las fracciones a formas simples:

1. Dividiendo por el máximo factor común (Lección 4A-9)
2. Por substitución (Lección 4A-10)

Después, haga que los alumnos resuelvan los problemas de simplificación de fracciones que van en la hoja de trabajo M4-9.

SOURCES.) Write several examples of fractions on the board, for example 1/2, 2/3, 1/4, 5/6, etc., and have the students find as many fractions as they can which are equivalent to them.

Explain what is meant by a fraction in its simplest form (Lesson 4A-8). Write several examples of fractions on the board, such as: 15/20, 4/7, 5/9, 6/16, 6/9, and 4/5, and have the students select the ones that are in simplest form. Using examples, show the students how to write a simpler fraction for any given fraction:

1. By dividing by the greatest common factor (Lesson 4A-9)
2. By substitution (Lesson 4A-10)

Then have the students simplify the fractions on Worksheet M4-9.

EXPRESSING MIXED NUMBERS AS IMPROPER FRACTIONS
SHORT CUT FOR CHANGING MIXED NUMBERS TO IMPROPER FRACTIONS
CHANGING IMPROPER FRACTIONS TO MIXED NUMBERS
SHORT CUT FOR CHANGING IMPROPER FRACTIONS TO MIXED NUMBERS

LESSONS 4A-11, 4A-12, 4A-13, 4A-14

Student Booklet p. 45

CONCEPTS

Mixed numeral
Improper fraction

VOCABULARY

fracción impropia	improper fraction
numeral mixto	mixed numeral

RESOURCES

1. A collection of items that will lend themselves well to identifying improper fractions and mixed numbers, such as soda or graham crackers, squares of baking chocolate, sticks of butter or margarine, pages of stamps or coupons, chocolate candy bars, ribbon, and slices of apples and oranges
2. Transparency M4-10
3. Transparency M4-11

PROCEDURE

Two days should be spent on this presentation: First day - Lessons 4A-11 and 4A-12; Second day - Lessons 4A-13 and 4A-14.

Utilizando ejemplos concretos, las siguientes actividades ayudarán a los estudiantes a comprender los conceptos de número mixto y fracciones equivalentes.

The following activities, which utilize concrete examples, will help the student understand the concepts of mixed numer and equivalent fractions.

Escriba en la pizarra varios numerales mixtos. Haga que los alumnos muestren visualmente el significado de esos numerales mixtos usando objetos de RESOURCE NO. 3 de la primera presentación, Lección 4A-1, 4A-3.

Write several mixed numerals on the board. Have the students illustrate these mixed numerals, using the objects from RESOURCE NO. 3 of the first presentation, Lesson 4A-1, 4A-3.

Use una transparencia hecha del modelo M4-10 para medir la longitud de un objeto, cuando la longitud se expresa en numerales mixtos. Mientras los estudiantes dicen la longitud de cada objeto, pida que señalen la posición del numeral mixto en la recta numérica.

Use a transparency made form Pattern M4-10 to measure the lengths of objects when the lengths are expressed as mixed numerals. As the students give the length of each object, have them indicate the location of the mixed numerals on a ruler.

Use una transparencia hecha del modelo M4-11 para comparar numerales mixtos con fracciones impropias. Explíqueles a los estudiantes que toda fracción impropia se puede expresar en un numeral mixto equivalente. Por ejemplo: 3/2 es equivalente a 1 1/2, puesto que ambos corresponden al mismo punto sobre la recta numérica. Pida que los estudiantes señalen grupos de fracciones impropias y numerales mixtos en las rectas numéricas de la transparencia.

Use a transparency made from Pattern M4-11 to compare mixed numerals to improper fractions. Explain to the students that each improper fraction is equivalent to a mixed numeral. For example: 3/2 is equivalent to 1 1/2, since they both correspond to the same point on the number line. Then have the students point out sets of equivalent fractions and mixed numerals on the number lines of the transparency.

Ejemplos - Examples

5/2 = 2 1/2

10/4 = 2 2/4

3/2 = 1 1/2 = 6/4 = 1 2/4

Primer día

Por medio del método presentado en la Lección 4A-11, explíqueles cómo cambiar un numeral mixto a una fracción impropia y después ayude a los estudiantes a descubrir el método corto presentado en la Lección 4A-12. Haga que los estudiantes practiquen el método corto.

First day

Explain how to change a mixed numeral to an improper fraction by the method shown in Lesson 4A-11, and then lead the students to discover the short cut method of Lesson 4A-12. Give the students practice in using the short cut method.

Segundo día

Por medio del método presentado en la Lección 4A-13, explíqueles cómo cambiar una fracción impropia a un numeral mixto y después ayude a los estudiantes a descubrir el método corto presentado en la Lección 4A-14. Haga que los estudiantes practiquen el método corto.

Second day

Explain how to change an improper fraction to a mixed numeral by the method shown in Lesson 4A-13, and then lead the students to discover the short cut method of Lesson 4A-14. Give the students practice in using the short cut method.

MULTIPLICATION OF FRACTIONS

LESSON 4A-15

Student Booklet p. 63

CONCEPT

Multiplication of proper fractions

VOCABULARY

denominador	denominator
fracciones	fractions
fracciones propias	proper fractions
multiplicación	multiplication
numerado	numerator

RESOURCES

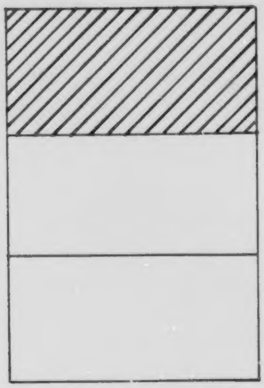
Transparencies #1 and #2, described in the Procedure

PROCEDURE

Explíqueles cómo calcular el producto de dos fracciones, multiplicando los numeradores entre sí y multiplicando los denominadores entre sí, y simplificando la respuesta después. Haga que los estudiantes resuelvan los problemas del Ejercicio 4A-15, dejando hasta la siguiente lección el método de eliminación.	Explain how to find the product of two fractions by multiplying the numerators together and the denominators together, and then simplifying the answer. Have the students use this method to work Exercise 4A-15, waiting until the next lesson to use the cancellation method.
Por medio del siguiente procedimiento demuestre el hecho de que en la multiplicación de fracciones, como	By means of the following procedure, illustrate the fact that in multiplication problems involving fractions, such as
1/3 x 1/2, el símbolo "x" significa "de".	1/3 x 1/2, the symbol "x" means "of".
(Los estudiantes pueden participar doblando y ensombreciendo su papel).	(The student may participate by shading their own papers.)

Haga las transparencias #1 y #2 que van a continuación. (Note: Los rectángulos deben ser congruentes).

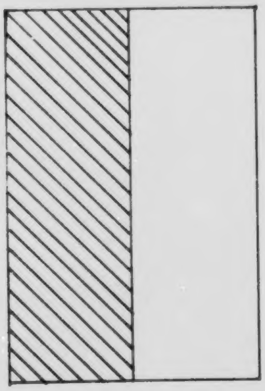
Make transparencies #1 and #2 using the patterns shown below. (Note: The rectangles must be congruent.)



Transparencia #1
Transparency #1

Ponga la transparencia #1 en el proyector y hágales notar que la zona ensombrecida es 1/3.

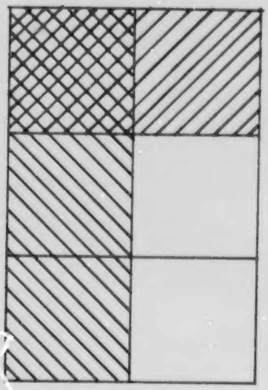
Place Transparency #1 on the projector and explain that the shaded region is 1/3.



Transparencia #2
Transparency #2

A continuación quite la transparencia #1 y ponga la #2. Hágales notar que la zona ensombrecida es 1/2.

Next, remove Transparency #1 and place Transparency #2. Explain that the shaded region is 1/2.



1/3 x 1/2

1/3 de (of) 1/2

Ponga la transparencia #2 sobre la #1. Explíqueles cómo la porción de partes ensombrecidas que se sobrepone, es: 1/3 of 1/2, que es 1/6.
1/3 x 1/2 se puede expresar como 1/3 de 1/2.

Now place Transparency #2 over Transparency #1. Explain that the shaded region which overlaps is: 1/3 of 1/2, which is 1/6.
1/3 x 1/2 can be expressed as 1/3 of 1/2.

SHORTCUT TO MULTIPLICATION - CANCELLATION

LESSON 4A-16

Student Booklet p. 67

CONCEPT

Multiplication of fractions using cancellation

VOCABULARY

eliminación	cancellation
simplificación	simplification

RESOURCES

1. Dartboard with fractions in each ring
2. Transparencies #1 and #2 described in the Procedure
3. Worksheet M4-12

PROCEDURE

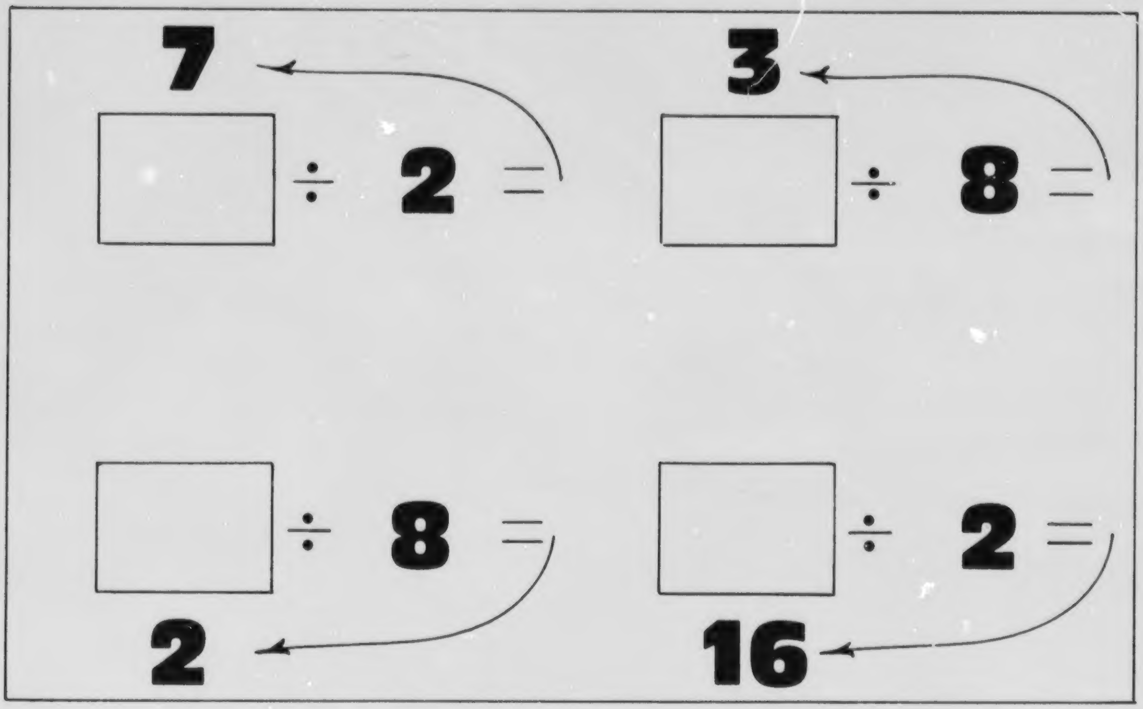
Presente el método de eliminación en la multiplicación, sobreponiendo la transparencia #2 en la transparencia #1.

Destaque el hecho de que es necesario dividir el numerador y el denominador por el mismo factor común.

Present the cancellation method of multiplying fractions, placing Transparency #2 as an overlay on Transparency #1.

Emphasize the fact that a numerator and denominator must be divided by the same common factor.

$$\frac{14}{16} \times \frac{24}{32}$$

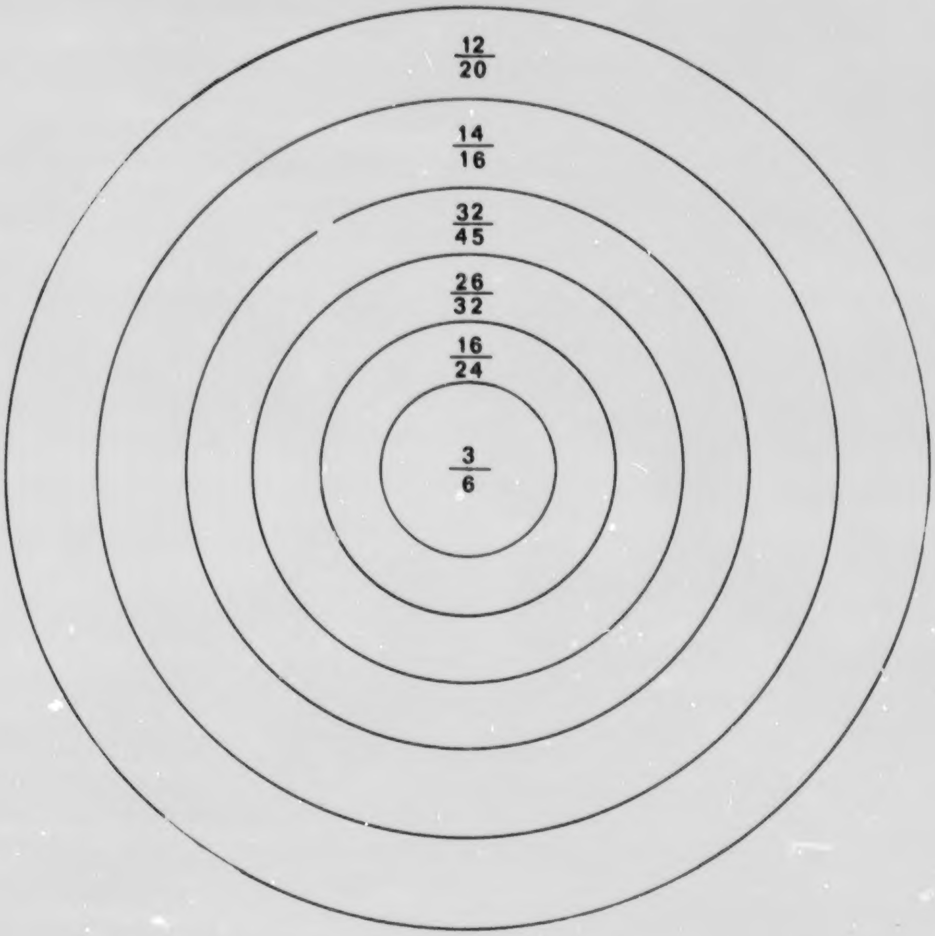


Haga que los alumnos resuelvan los problemas de multiplicación en la hoja de trabajo M4-12.

Dibuje un blanco, como para tiro de flechas, y marque los círculos con fracciones. Haga que cada estudiante, por turno, tire dos flechas y después multiplique las fracciones de los círculos donde se claven las flechas, sin olvidar de eliminar antes de multiplicar. Cada respuesta vale un punto. Ganará el estudiante que obtenga el resultando más alto.

Have the students solve the multiplication problems on Worksheet M4-12.

Make a dartboard with a fraction in each ring. Have each student in turn throw two darts and then multiply the fractions which correspond to the regions where the darts landed, remembering to cancel before multiplying. He receives one point for each correct answer. The student with the highest score wins.


12/20
14/16
32/45
26/32
16/24
3/6

MULTIPLYING MIXED NUMBERS BY PROPER FRACTIONS

LESSON 4A-17

Student Booklet p. 75

CONCEPT

Multiplication of mixed numbers and proper fractions

VOCABULARY

fracción impropia	improper fraction
fracción propia	proper fraction
número mixto	mixed numer

RESOURCE

Transparency M4-13

PROCEDURE

Utilizando la pizarra, explíqueles claramente el proceso de la multiplicación de números mixtos y fracciones propias. Al resolver problemas, explíqueles paso a paso, cómo está presentado en la tabla de flujo en la Lección 4A-17. Pida a los estudiantes que usen la pizarra para resolver los problemas.

Por medio de la Actividad M4-13, haga que los estudiantes practiquen la multiplicación de fracciones propias por números mixtos.

By means of a chalkboard demonstration, explain the process of multiplying a mixed number and a proper fraction. As you work examples, explain each step as it is shown in the flow chart in Lesson 4A-17. Have the students come to the board and work problems.

Through a presentation of Activity M4-13, have the students practice multiplying proper fractions by mixed numbers.

MULTIPLYING MIXED NUMBERS

LESSON 4A-18

Student Booklet p. 79

CONCEPT

Multiplication of mixed numbers

VOCABULARY

None

RESOURCE

Transparency M4-14

PROCEDURE

Utilizando la pizarra, explíqueles cómo multiplicar un número mixto por otro número mixto. Al resolver problemas, explíqueles a cada paso cómo está presentado en la tabla de flujo en la lección 4A-18. Pida a los estudiantes que usen la pizarra y resuelvan los problemas.

Por medio de la actividad M4-14, haga que los estudiantes practiquen la multiplicación de fracciones por números enteros.

By means of a chalkboard demonstration, explain how to multiply a mixed number by a mixed number. As you work examples, explain each step as it is shown in the flow chart in Lesson 4A-18. Have the students come to the board and work problems.

Through a presentation of Activity M4-14, have the students practice multiplying fractions by whole numbers.

STATED PROBLEMS, PROPERTIES

LESSONS 4A-19 and 4A-20

Student Booklet p. 83

CONCEPT

Solution of stated problems which involve the multiplication of rational numbers

VOCABULARY

propiedad	property

RESOURCES

None

PROCEDURE

Presente las propiedades de la multiplicación demostrándolas por medio de ejemplos que contengan fracciones y pida que los estudiantes identifiquen cada propiedad.	Present the multiplication properties, illustrating them by means of examples which contain fractions, and have the students identify each property.
Resuelva con los alumnos los problemas descriptivos que se dan. Ayude a los estudiantes a encontrar palabras claves que indiquen que los problemas son de multiplicación.	Work the stated problems with the class. Help the students find key words or phrases which indicate that the numbers are to be multiplied.

DIVISIÓN DE FRACCIONES

OVERVIEW OF LEVEL 4B

DIVISIÓN DE FRACCIONES

OVERVIEW OF LEVEL 4B

Level 4B contains basic skills pertaining to the division of fractions. To provide a background for building basic skills in carrying out a mathematical process, the teacher should explain why the process is done. It will be useful to have on display a bulletin board similar to the one shown below, which shows the principles involved in the inversion method of division of fractions and demonstrates why the method works.

DIVISIÓN DE FRACCIONES
DIVISION OF FRACTIONS

RESUELVE: $\frac{5}{6} \div \frac{2}{3}$
SOLVE:

$$\frac{\frac{5}{6}}{\frac{2}{3}} \begin{array}{l} \leftarrow \text{DIVIDENDO} \\ \ \text{DIVIDEND} \\ \leftarrow \text{DIVISOR} \end{array}$$

HAGA QUE EL DIVISOR
SE CONVIERTE EN UNO:
MAKE THE DIVISOR ONE:

$$\frac{\frac{5}{6} \times \frac{3}{2}}{\frac{2}{3} \times \frac{3}{2}} = \frac{\frac{5}{6} \times \frac{3}{2}}{1} = \frac{\frac{5}{4}}{1} = \frac{5}{4} \leftarrow \begin{array}{l} \text{COCIENTE} \\ \text{QUOTIENT} \end{array}$$

COMPLEX FRACTIONS
RECIPROCALS
DIVIDING COMPLEX FRACTIONS

LESSONS 4B-1, 4B-2, 4B-3

Student Booklet p. 3

CONCEPTS

Complex fractions
Reciprocals
Rule for division of fractions

VOCABULARY

denominador	denominator
división	division
divisor	divisor
fracción compleja	complex fraction
numerador	numerator
recíproco	reciprocal

RESOURCES

None

PROCEDURE

Introduzca el término fracción compleja, escribiendo varios ejemplos en la pizarra. Explíqueles que una fracción compleja es otro modo de expresar un problema de división de fracciones y haga que los alumnos usen la pizarra para escribir problemas de división en la forma de fracciones complejas.	Introduce the term complex fraction, writing several examples on the board. Explain that a complex fraction is another way of writing a division problem involving fractions, and have the students come to the board to write division problems in the form of complex fractions.
Explíqueles la definición de recíproco y presente varios ejemplos, notando que el recíproco de un número dado también se llama elemento inverso de la multiplicación.	Explain the definition of reciprocal and give several examples, pointing out that the reciprocal of a number is also called its multiplicative inverse.

Ejemplo - Example

2/5 x 5/2 = 10/10 = 1

Por tanto, 5/2 ó 2 1/2 es recíproco de 2/5.

Antes de buscar el recíproco de un número dado, los estudiantes siempre deben expresar el número en forma de una fracción simple, si ya no se expresa así.

Therefore, 5/2 or 2 1/2 is the reciprocal of 2/5.

The students should always express a given number as a simple fraction if it is not already in that form before they try to find its reciprocal.

Número Number	Fracción simple Simple fraction	Recíproco Reciprocal
3/7	3/7	7/3 ó (or) 2 1/3
8	8/1	1/8
2 3/5	13/5	5/13

En la Lección 4A-4, los estudiantes aprenderán cómo dividir fracciones expresando cada problema en forma de problema de multiplicación y invirtiendo el divisor. Para explicar los fundamentos y el por qué del proceso escriba un problema de división, expresándolo en forma de una fracción compleja. Después, simplifique la fracción, paso a paso.

In Lesson 4A-4, the students will learn how to divide fractions, rewriting each problem as a multiplication problem and inverting the divisor. To explain the principles involved in this porcess and to demonstrate why it works, write a division problem as a complex fraction and simplify it, step by step.

Ejemplos - Examples

1. 2/7 - 3/4
2. $\frac{2/7}{3/4}$
3. $\frac{2/7}{3/4 \times 3/4}$
4. $\frac{2/7 \times 4/3}{3/4 \times 4/3}$
5. $\frac{2/7 \times 4/3}{1} = 2/7 \times 4/3$
6. 8/21

Escriba el problema de división en forma de una fracción compleja.

Para simplificar la fracción compleja, multiplique el denomi-

Rewrite the division problem as a complex fraction.

To simplify the complex fraction, multiply the denominator by its nador por su recíproco, convirtiéndolo en 1.

Puesto que multiplicamos el denominador por 4/3, también debemos multiplicar el numerador por 4/3.

Si cualquier número se divide por 1, el cociente será este mismo número.

Respuesta de ejemplo #1.

Hágales ver que

2/7 - 3/4 (Paso 1) 2/7 x 4/3 (Paso 5).

Por lo tanto, sale la regla que se usa en división de fracciones:

> Si a/b y c/d son cualesquier fracciones y b, c y d = 0, entonces: a/b ÷ c/d = a/b x d/c

Para ayudar a los estudiantes a comprender el proceso de la división de fracciones, pida que resuelvan los problemas del Ejercicio 4B-3, utilizando el método presentado en el ejemplo anterior.

reciprocal in order to make it equal 1.

Since we multiplied the denominator by 4/3, we must also multiply the numerator by 4/3.

When any non-zero number is divided by 1, the quotient is that same number.

Answer of sample #1.

Point out that:

2/7 x 3/4 (Step 1) = 2/7 x 4/3 (Step 5).

Thus, the rule for division of fractions is:

> If a/b and c/d are fractions and b, c, and d = 0, then: a/b ÷ c/d = a/b x d/c

To help the students understand the process of division of fractions, have them solve the problems of Exercise 4B-3, using the method shown in the preceding example.

RULE FOR DIVISION OF FRACTIONS
WHOLE NUMBER IN DIVISION

LESSONS 4B-4, 4B-5

Student Booklet p. 15

CONCEPTS

Rule for division of fractions
Division of proper fractions and whole numbers

VOCABULARY

división	division
divisor	divisor
recíproco	reciprocal

RESOURCE

Transparency M4-15

PROCEDURE

Repase la regla que se usa en la divisón de fracciones (Lección 4B-4). Siguiendo los pasos en la tabla de flujo en la Lección 4B-4, muéstreles cómo resolver problemas de la división de fracciones propias.

Presentando los ejemplos de la transparencia M4-15, muéstreles cómo resolver problemas de la división de fracciones y números enteros. Insista en que los estudiantes siempre escriban el número entero en forma fraccional. Esto les ayudará a determinar correctamente el recíproco del entero.

Review the rule for division of fractions (Lesson 4B-4). Demonstrate how to solve problems involving division of proper fractions, following the steps of the flow chart in Lesson 4B-4.

Explain how to work division problems involving fractions and whole numbers, presenting the examples of Transparency M4-15. Insist that the students always write the whole number in fractional form. This will help them determine its reciprocal correctly.

Ejemplo - Example

$$2/3 \div 12 = 2/3 \div 12/1 = \overset{1}{\cancel{2}}/3 \times 1/\underset{6}{\cancel{12}} = 1/18$$

MIXED NUMBERS IN DIVISION
MORE DIVISION WITH MIXED NUMBERS

LESSONS B-6, 4B-7

Student Booklet p. 23

CONCEPT

Division of mixed numbers

RESOURCE

Transparency M4-16

PROCEDURE

Poniendo énfasis en ejemplos de números mixtos y números enteros, repase el proceso de determinar el recíproco de un número dado.

Después siguiendo los paso de las tablas de flujo en las Lecciones 4B-7, 4B-8, explíqueles cómo resolver problemas de la multiplicación de números mixtos. Presente los ejemplos de la transparencia M4-16.

Al resolver problemas, muéstreles cada paso del proceso de multiplicación e insista en que los estudiantes presenten por escrito cada paso cuando resuelven los problemas de los ejercicios.

Review the process of finding the reciprocal of a given number, stressing examples of mixed numbers and whole numbers.

Then, following the steps shown in the flow charts in Lessons 4B-7 and 4B-8, explain how to solve multiplication problems involving mixed numbers, presenting the examples of Transparency M4-16.

As you solve the problems, show each step of the process, and insist that the students show each step when they work the problems in the exercises.

Ejemplos - Examples

$$5 \div 2\ 1/8 = 5/1 \div 17/8 = 5/1 \times 8/17 = 40/17 = 2\ 6/17$$

$$2\ 1/2 \div 1\ 3/4 = 5/2 \div 7/4 = 5/\underset{1}{\cancel{2}} \times \overset{2}{\cancel{4}}/7 = 10/7 = 1\ 3/7$$

SUMMARY OF DIVISION OF RATIONAL NUMBERS STATED PROBLEMS

LESSONS 4B-8, 4B-9

Student Booklet p. 31

CONCEPTS

Division of proper fractions, whole numbers, and mixed numbers
Solution of stated problems which involve the division of rational numbers

VOCABULARY

números racionales	rational numbers
problemas descriptivos	stated problems

RESOURCES

None

PROCEDURE

Repase el concepto de división de números racionales, utilizando la pizarra para explicarles varios problemas.

La explicación debe incluir los pasos en la tabla de flujo que va en la Lección 4B-8. Ayude a los estudiantes a praticipar en la resolución de los problemas.

Resuelva con los alumnos varios de los problemas descriptivos de la Lección 4B-8. Ayude a los estudiantes a encontrar palabras claves que indiquen que los problemas son de división. Haga que los estudiantes planteen cada problema en la siguiente manera.

Review the concept of division of rational numbers, explaining several problems by means of a chalkboard demonstration.

Utilize the steps in the flow chart of Lesson 4B-8 for your explanation, and encourage the students to participate in the solution of the problems.

Work several of the stated problems of Lesson 4B-8 with the class. Help the students find key words or phrases which indicate that the numbers are to be divided. Have the students set up each problem in the following manner:

$$\boxed{\begin{array}{l}\text{Unidad entera}\\ \text{(Total amount)}\end{array}} \div \boxed{\begin{array}{l}\text{El número que la separa}\\ \text{(The number which separates it)}\end{array}} = \underline{\hspace{3cm}}$$

CLAVE/ANSWER KEY

MANUAL DEL ESTUDIANTE
STUDENT BOOKLET

NIVEL 4A/LEVEL 4A

CLAVE / ANSWER KEY

MANUAL DEL ESTUDIANTE/STUDENT BOOKLET

NIVEL 4A / LEVEL 4A

EJERCICIO 4A-1/EXERCISE 4A-1, pages 4-5

1. 1/2
2. 3/6
3. 4/2
4. 9/5
5. 9/10
6. 8/3
7. 6/4
8. 7/11
9. 8/3
10. 4/1

EJERCICIO 4A-2/EXERCISE 4A-2, pages 8-9

1. 1/2
2. 2/4
3. 2/8
4. 4/6
5. 3/5

EJERCICIO 4A-3/EXERCISE 4A-3, pages 12-13

1. ▭
2. ○
3. △
4. ▭
5. ○
6. ○
7. ○
8. △

EJERCICIO 4A-3/EXERCISE 4A-3 (Cont.), pages 12-13

9. △

10. △

11. ▭

12. ▭

13. △

14. ▭

15. ○

16. ○

17. ○

18. ▭

19. ▭

20. △

EJERCICIO 4A-4/EXERCISE 4A-4, pages 16-17

1. 1/4 = 2/8

2. 2/3 = 4/6

3. 1/4 = 4/16

4. 3/4 = 6/8

EJERCICIO 4A-5/EXERCISE 4A-5, pages 22-23

1. 4/4

2. 6/6

3. 3/3

4. 5/5

5. 4/4

6. 8/8

7. 2/2

8. 1/1

9. 7/7

10. 3/3

11. 2

12. 25

13. 25

14. 9

15. 10

16. 6

17. 25

18. 4

19. 12

20. 63

21. 18

22. 27

EJERCICIO 4A-6/EXERCISE 4A-6, pages 26-27

1. no
2. no
3. sí - yes
4. no
5. no
6. sí - yes
7. no
8. no
9. sí - yes
10. sí - yes
11. no
12. sí - yes
13. sí - yes
14. sí - yes
15. no
16. sí - yes
17. no
18. no

EJERCICIO 4A-7/EXERCISE 4A-7, pages 30-31

1. 25
2. 56
3. 45
4. 45
5. 30
6. 75
7. 42
8. 40
9. 6
10. 49
11. 4
12. 24
13. 4
14. 32
15. 9
16. 9
17. 16
18. 5

EJERCICIO 4A-8/EXERCISE 4A-8, pages 32-33

1. △

2. *

3. *

4. △

5. *

6. △

7. △

8. *

9. *

10. △

EJERCICIO 4A-9/EXERCISE 4A-9, pages 36-37

1. 5/6

2. 1/2

3. 1/2

4. 1/3

5. 1/6

6. 2/3

7. 2/5

8. 1/2

9. 1/2

10. 1/2

11. 3/5

12. 1/3

13. 1/3

14. 2/3

15. 2/3

16. 8/9

17. 1/3

18. 1/3

19. 1/3

20. 1/3

EJERCICIO 4A-10/EXERCISE 4A-10, pages 42-43

1. 7/11

2. 5/8

3. 4/9

4. 1/4

EJERCICIO 4A-10/EXERCISE 4A-10, (Cont.), pages 42-43

5. 5/11
6. 6/7
7. 2/3
8. 4/11
9. 3/5
10. 1/6
11. 1/2
12. 1/2
13. 4/5
14. 3/4
15. 3/5
16. 1/3
17. 3/5
18. 5/6
19. 2/3
20. 7/11

EJERCICIO 4A-11/EXERCISE 4A-11, pages 46-47

1. 17/3
2. 3/2
3. 13/4
4. 20/3
5. 19/2
6. 18/8
7. 33/6
8. 17/2
9. 19/4
10. 61/8

EJERCICIO 4A-12/EXERCISE 4A-12, pages 50-51

1. 15/2
2. 5/2
3. 17/6
4. 11/8
5. 54/7
6. 20/3
7. 5/3
8. 11/4
9. 5/4
10. 39/9
11. 41/2
12. 7/3
13. 9/4
14. 38/8
15. 70/8
16. 64/5

EJERCICIO 4A-12/EXERCISE 4A-12 (Cont.), pages 50-51

17. 20/7
18. 21/10
19. 42/10
20. 50/6

EJERCICIO 4A-13/EXERCISE 4A-13, pages 54-55

1. 1 2/5
2. 1 1/5
3. 1 1/2
4. 1 1/3
5. 2 1/3
6. 2 3/4
7. 4 1/4
8. 1 1/2
9. 2 3/4
10. 2 3/8
11. 4 1/4
12. 4 3/5
13. 2 2/3
14. 3 1/3
15. 6 1/3
16. 2 5/8
17. 1 1/4
18. 2 1/2
19. 1 1/2
20. 8 2/3

EJERCICIO 4A-14/EXERCISE 4A-14, pages 60-61

1. 2 1/4
2. 2 2/3
3. 1 3/4
4. 2 1/7
5. 3 1/7
6. 4 3/8
7. 1 1/5
8. 1 4/5
9. 4 5/6
10. 2 2/5
11. 9 1/2
12. 6 1/7
13. 1 1/8
14. 2 1/3
15. 4 2/3
16. 2 1/9
17. 5 2/5
18. 6 7/8
19. 1 2/3
20. 2

EJERCICIO 4A-15/EXERCISE 4A-15, pages 64-65

1. 6/35
2. 3/14
3. 2/9
4. 4/7
5. 3/10
6. 7/32
7. 3/4
8. 4/15
9. 77/96
10. 21/32
11. 4/45
12. 1/3
13. 6/49
14. 21/80
15. 7/24
16. 25/48
17. 7/12
18. 1/6
19. 6/35
20. 2/21

EJERCICIO 4A-16/EXERCISE 4A-16, pages 72-73

1. 7/32
2. 9/40
3. 2/3
4. 2/3
5. 1 3/4
6. 2/5
7. 1
8. 4/15
9. 2 2/3
10. 1/5
11. 1/4
12. 1
13. 1
14. 1 1/2
15. 7/15
16. 2/3
17. 1
18. 21/26
19. 1/9
20. 5/9

EJERCICIO 4A-17/EXERCISE 4A-17, pages 76-77

1. 2 1/3
2. 11/24
3. 3 17/56
4. 4 25/27
5. 1 7/12
6. 1 11/36
7. 5 10/21
8. 3 1/15
9. 27/80
10. 23/32
11. 3 7/10
12. 2 2/9
13. 5/9
14. 3 9/14
15. 2 20/21
16. 2 1/7
17. 1 2/5
18. 1 3/4

EJERCICIO 4A-18/EXERCISE 4A-18, pages 80-81

1. 1 1/2
2. 25
3. 1
4. 3 1/5
5. 6 1/2
6. 3/4
7. 10 11/16
8. 4 3/8
9. 18 1/3
10. 4 3/8
11. 4 19/32
12. 14 5/8
13. 55/192
14. 6 4/21
15. 5 43/81
16. 5/56
17. 2 6/35
18. 244 7/24

EJERCICIO 4A-19/EXERCISE 4A-19, pages 84-85

1. 1/3 de galón - 1/3 of a gallon
2. 1/4 del cuarto - 1/4 of the room
3. 2 lb.
4. 5 5/6 horas - 5 5/6 hours
5. 2 1/4 horas - 2 1/4 hours
6. 8 1/3 horas - 8 1/3 hours
7. 10 1/3 libras - 10 1/3 pounds
8. 6 3/4 dólares ó $6.75 - 6 3/4 dollars or $6.75
9. 412 1/2 centavos ó $4.13 - 412 1/2 cents or $4.13
10. 80 problemas - 80 problems

EJERCICIO 4A-20/EXERCISE 4A-20, pages 88-89

1. (3/4 x 5/7) x 1/6
2. 4/9 x (1 1/3 x 5)
3. 6 x (7 x 1/3)
4. (8 3/4 x 1 1/2) x 7 5/6
5. 3 x (4/7 x 8/9)
6. 1/2 x 7/8
7. 2 1/3 x 3/4
8. 4/7 x 7
9. 1 9/10 x 8 3/4
10. 2 2/6 x 5 1/3
11. Propiedad de identidad de la multiplicación - Multiplicative Identity Property
12. Propiedad conmutativa - Commutative Property
13. Propiedad del cero en la multiplicación - Multiplicative property of Zero
14. Propiedad asociativa - Associative Property
15. Propiedad conmutativa - Commutative Property

REPASO 4A/REVIEW 4A, pages 90-91

1. a. 1/2
   b. 7/8
   c. 4/5
   d. 5/6
   e. 1/2
   f. 13/21
2. a. 13/4
   b. 19/8
   c. 17/3
   d. 15/2
   e. 32/7

REPASO 4A/REVIEW 4A (Cont.), pages 90-91

3. a. 8 1/3
   b. 9 1/2
   c. 4 1/3
   d. 7 1/2
   e. 6 3/7

4. a. 16
   b. 15
   c. 28
   d. 40
   e. 90
   f. 30

5. a. 1/4
   b. 3/7
   c. 1/2
   d. 12
   e. 5/8
   f. 16 7/8
   g. 15 3/4
   h. 5 7/8
   i. 2 5/8
   j. 58 1/3

6. a. 7 7/12 millas - 7 7/12 miles
   b. 18 bushels - 18 bushels
   c. 52 1/2 cuadras - 52 1/2 blocks
   d. 65 1/3 galones - 65 1/3 gallons

CLAVE/ANSWER KEY

MANUAL DEL ESTUDIANTE
STUDENT BOOKLET

NIVEL 4B/LEVEL 4B

CLAVE / ANSWER KEY

MANUAL DEL ESTUDIANTE/STUDENT BOOKLET

NIVEL 4B/LEVEL 4B

EJERCICIO 4B-1/EXERCISE 4B-1, pages 4-5

1. $\frac{4/5}{2/5}$
2. $\frac{3/5}{1/2}$
3. $\frac{4/9}{1/5}$
4. $\frac{1/5}{1/2}$
5. $\frac{1/3}{1/2}$
6. $\frac{7/8}{7/10}$
7. $\frac{4/7}{2/3}$
8. $\frac{1/8}{1/4}$
9. $\frac{4/5}{1/10}$
10. $\frac{4/9}{1/5}$
11. $\frac{7/8}{7/10}$
12. $\frac{1/2}{6}$

EJERCICIO 4B-2/EXERCISE 4B-2, pages 8-9

1. 8/7
2. 1/3
3. 1/15
4. 9/46
5. 11/13
6. 1/17
7. 9/8
8. 8/15
9. 12/53
10. 1/11
11. 11/7
12. 11/1
13. 3/17
14. 1/10
15. 5/3
16. 8/55
17. 5/4
18. 7/5
19. 9/4
20. 7/20

EJERCICIO 4B-3/EXERCISE 4B-3, pages 12-13

1. 1 1/2
2. 1/2
3. 2/7
4. 1 1/4
5. 1
6. 1 17/32
7. 9/14
8. 2

EJERCICIO 4B-4/EXERCISE 4B-4, pages 16-17

1. 2/3
2. 4/5
3. 15/16
4. 20/21
5. 1 1/20
6. 2 11/12
7. 4/9
8. 2/3
9. 5/6
10. 5/6
11. 1
12. 5 5/6
13. 4/25
14. 15/28
15. 2 4/25
16. 3/16
17. 4/7
18. 1 1/2
19. 2
20. 1 1/2

EJERCICIO 4B-5/EXERCISE 4B-5, pages 22-23

1. 48
2. 59 1/2
3. 114
4. 104
5. 45
6. 16
7. 10
8. 7 1/5
9. 15
10. 1/168
11. 3/32
12. 1/108
13. 2/147
14. 1/30

EJERCICIO 4B-5/EXERCISE 4B-5 (Cont.), pages 22-23

15. 1/24
16. 1/160
17. 1/8
18. 1/16

EJERCICIO 4B-6/EXERCISE 4B-6, pages 24-25

1. 3/4
2. 7/18
3. 37/80
4. 20/21
5. 1 9/16
6. 9/10
7. 7/9
8. 7/15
9. 2/7
10. 4 1/2
11. 1 1/2
12. 12/19
13. 8 2/5
14. 2
15. 3
16. 1 1/3
17. 1 1/4
18. 16/17

EJERCICIO 4B-7/EXERCISE 4B-7, pages 28-29

1. 4 1/2
2. 14
3. 2
4. 3 2/3
5. 5 3/5
6. 4 1/2
7. 6 3/10
8. 3 1/9
9. 4 1/5
10. 3 1/9
11. 1 1/9
12. 3
13. 2 1/4
14. 18/35
15. 9/20
16. 3 3/4
17. 1 1/2
18. 13/22
19. 4 1/2
20. 3 1/9

EJERCICIO 4B-8/EXERCISE 4B-8, pages 32-33

1. 8/9
2. 4
3. 4 1/2
4. 18 2/3
5. 1 29/36
6. 5 1/15
7. 1/24
8. 3/20
9. 1 [illegible]8
10. 25/54
11. 3/4
12. 7/12
13. 10 2/9
14. 12
15. 3/7
16. 1/27
17. 5/8
18. 1 3/5
19. 2 1/4
20. 5/56
21. 3/4
22. 5
23. 4 2/7
24. 3 5/21
25. 1 25/104
26. 5/14
27. 5/14
28. 17/52

EJERCICIO 4B-9/EXERCISE 4B-9, pages 38-39

1. 16 máquinas - 16 machines
2. 16 personas - 16 people
3. 1/10 del cuarto - 1/10 of the room
4. 2 1/2 pedazos - 2 1/2 pieces
5. 18 pasteles - 18 cakes
6. 1/16 de un galón - 1/16 of a gallon
7. 2 7/8 galones - 2 7/8 gallons
8. 12 4/5 días - 12 4/5 days
9. 10 libros - 10 books
10. 6 3/5 cargos de arena - 6 3/5 loads of sand

REPASO 4B/REVIEW 4B, pages 40-45

1. 7/11
2. 2/3
3. 9/13
4. 3
5. 3/5
6. 2 1/2
7. 4/5
8. 4/11
9. 7
10. 7/4
11. 48/7
12. 8/1
13. 43/9
14. 13/5
15. 3/1
16. 5/1
17. 34/8
18. 43/6
19. 10
20. 4 11/12
21. 9 2/5
22. 6
23. 8 1/2
24. 1 11/16
25. 28 2/3
26. 32 4/5
27. 5
28. 16/75
29. 6/35
30. 1 1/2
31. 7
32. 5/9
33. 15 1/8
34. 40 5/8
35. 49 7/9
36. 38 83/96
37. $\frac{3/4}{2/3}$
38. $\frac{1\ 1/5}{5/6}$
39. $\frac{7/1}{3/4}$
40. 5/1
41. 1/7
42. 6/5
43. 2/7
44. 1/8
45. 7/40
46. 3 4/7

REPASO 4B/REVIEW (Cont.), pages 40-45

47. 2 1/4

48. 1/3

49. 12

50. 2

51. 24/85

52. 3 9/32

53. 1 1/4

54. 9 3/5

55. 21

56. 60 12/19

57. 11 2/3

58. 48

59. 8

CLAVE/ANSWER KEY

MODELOS Y ACTIVIDADES
PATTERNS AND ACTIVITIES

NIVEL 4/LEVEL 4

CLAVE/ANSWER KEY

MODELOS Y ACTIVIDADES/PATTERNS AND ACTIVITIES

NIVEL 4 / LEVEL 4

M4-3

2/5

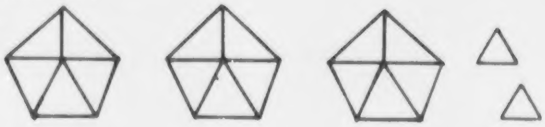
1/5

1/6

3/5

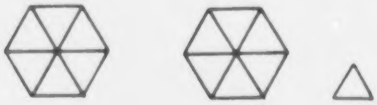
M4-4

3 2/5



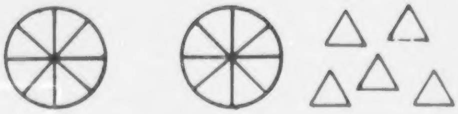
M4-5

2 1/6



M4-6

2 5/8



M4-7

(The design will show a car and a motorcycle.)

M4-8

1. 1/2; la pantera - the panther
2. 3/4 = 6/8 = 9/12
3. 1/2 = 2/4 = 4/8 = 6/12
4. 2/8, 3/12
5. 3/4, 4/4, 6/6, etc.
6. 0/3, 0/4, 0/6, etc.

M4-9

(The design will show two fingers raised to form the peace symbol.)

1. 2/3
2. 3/5
3. 2/7
4. 1/5
5. 3/8
6. 1/4
7. 2/9
8. 4/7
9. 4/5
10. 1/6
11. 1/7
12. 5/8
13. 3/4
14. 2/5
15. 3/7
16. 1/2
17. 7/8
18. 6/7
19. 5/6
20. 1/8
21. 5/7
22. 4/9
23. 1/3
24. 1/10

M4-12

1. 1/2
2. 3/10
3. 1/9
4. 1/14
5. 1/4
6. 1/2
7. 2/3
8. 7/24
9. 7/24
10. 3/14
11. 1/7
12. 3/4
13. 3/4
14. 9/20 (Spanish version only)

Messages:

DON'T GIVE UP YET

SALISTE MUY BIEN

M4-13

1. 3/14 pulgada - 3/14 inch
2. 33/56 pulgada - 33/56 inch
3. 1 1/8 pulgadas - 1 1/8 inches
4. 1 5/28 pulgadas - 1 5/28 inches
5. 1 1/2 pulgadas - 1 1/2 inches
6. 1 43/56 pulgadas - 1 43/56 inches

M4-14

1. 14
2. 12
3. 8
4. (a) 7 (b) 24
5. 19 lbs. (approximately)

M4-15

1. 12 bolitas - 12 beads
2. 3/8 del terreno - 3/8 of the land
3. 32 tiras - 32 slices
4. 1/8 libra - 1/8 pound
5. 16 piezas - 16 pieces

M4-16

1. 5 5/11 minutos - 5 5/11 minutes
2. 11 1/4 minutos - 11 1/4 minutes
3. 30 3/8 días - 30 3/8 days
4. 1/4 minuto - 1/4 minute

CLAVE/ANSWER KEY

EXÁMENES/TESTS

NIVEL 4/LEVEL 4

CLAVE/ANSWER KEY

EXAMEN I TEST I

NIVEL 4A / LEVEL 4A

1. 5/6
2. 3/2 ó (or) 1 1/2
3. 7
4. 1/2
5. 49/9
6. 7/1
7. 13/8
8. 13/6
9. 7
10. 5 4/5
11. 15/56
12. 1
13. 4 7/12
14. 1 2/3
15. 36
16. 8 5/14
17. 69
18. 20 1/4
19. 6
20. 1/8
21. 4/3
22. 7/33
23. 1 1/24
24. 4 2/7
25. 20
26. 34/45
27. 7/12
28. 3/4
29. 51 mph
30. 8 yardas - 8 yards

CLAVE/ANSWER KEY

EXAMEN 2 TEST 2

NIVEL 4/LEVEL 4

1. 2/3
2. 3
3. 1/2
4. 15/16 ó (or) 1 1/15
5. 15/4
6. 5/1
7. 15/7
8. 163/16
9. 7
10. 5 1/6
11. 9/40
12. 5/9
13. 1 2/5
14. 2 20/21
15. 4 19/32
16. 28 3/16
17. 7/8
18. 17
19. 5
20. 1/11
21. 7/5
22. 8/51
23. 8/9
24. 5
25. 21
26. 6 9/10
27. 1/4
28. 1 25/104
29. 12 días - 12 days
30. 10 1/3 lb.

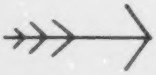
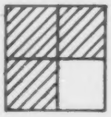
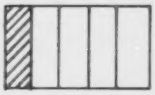
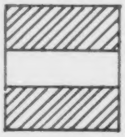
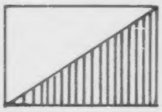
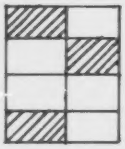
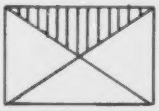
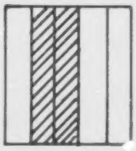
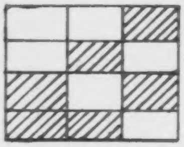
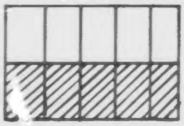
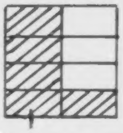
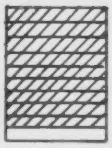
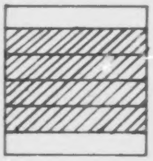
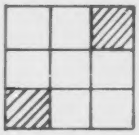
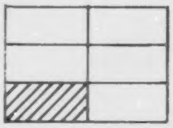
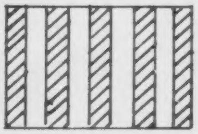
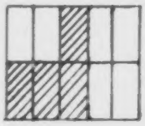
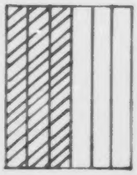
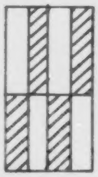
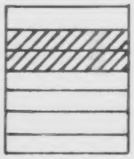
MODELOS Y ACTIVIDADES
PATTERNS AND ACTIVITIES

NIVEL 4/LEVEL 4

M4 - 1

FICHAS MATEMÁTICAS

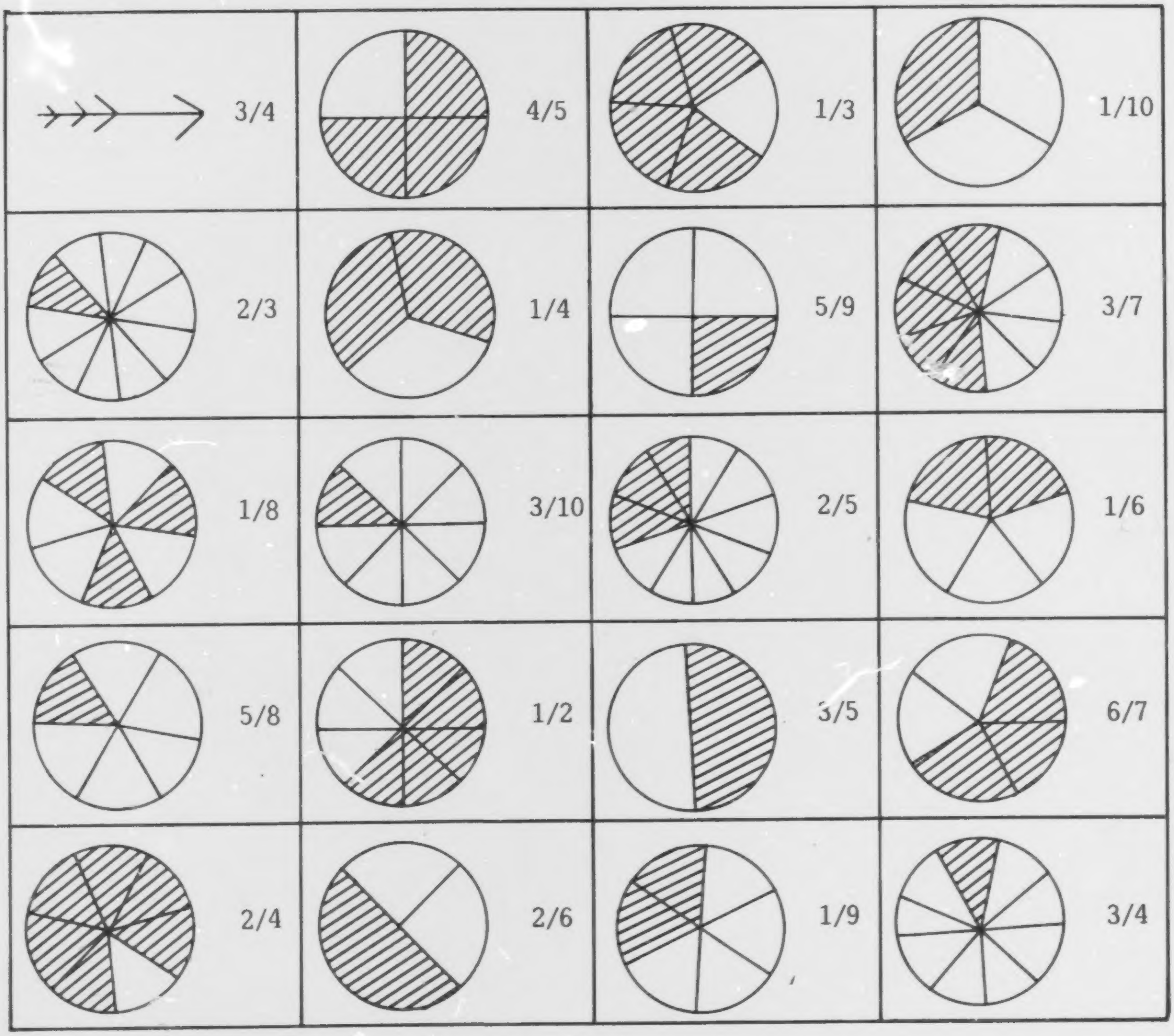
MATH DOMINOES

 3/4	 1/5	 2/3	 1/2
 3/8	 1/4	 2/5	 6/12
 5/10	 5/8	 9/10	 4/6
 2/9	 1/6	 5/9	 4/10
 3/6	 4/8	 2/7	 3/4

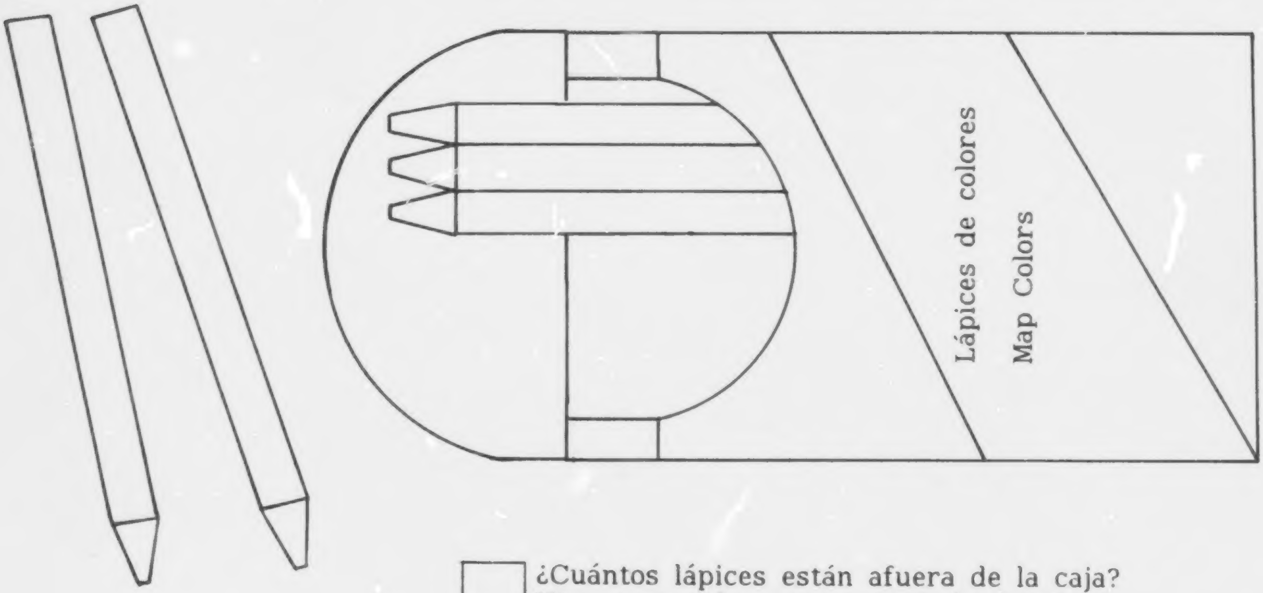
M4 - 2

FICHAS MATEMÁTICAS

MATH DOMINOES


3/4
4/5
1/3
1/10
2/3
1/4
5/9
3/7
1/8
3/10
2/5
1/6
5/8
1/2
3/5
6/7
2/4
2/6
1/9
3/4

M4 - 3

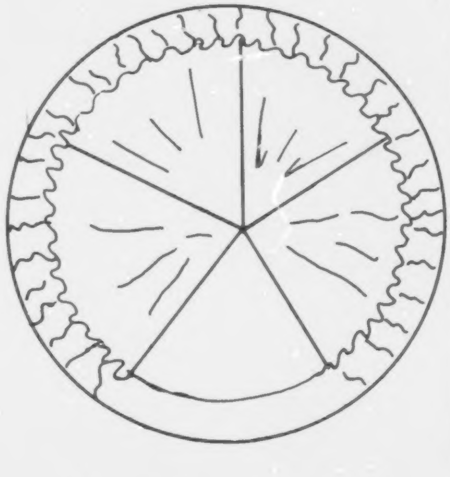


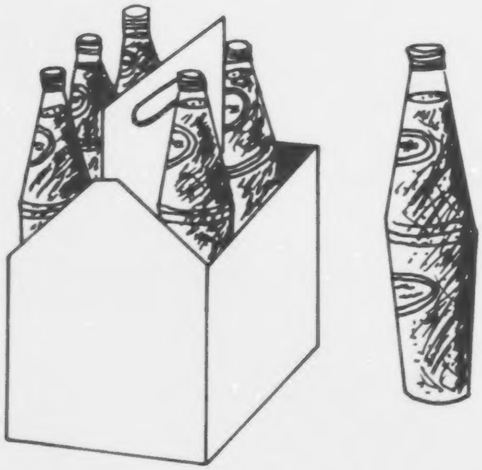
☐ ¿Cuántos lápices están afuera de la caja?
How many colors are out of the box?

☐ ¿Cuántos lápices hay en total?
How many map colors are there in all?

¿Cuántas piezas del pastel faltan?
How many pieces of pie are missing? ☐

¿Cuántas piezas del pastel había en total?
How many pieces of pie were there in all? ☐



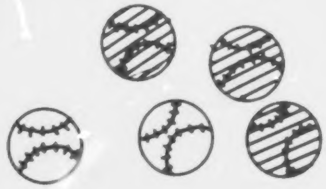


☐ ¿Cuántas botellas de Coca están a fuera de la caja?
How many Coke bottles are out of the carton?

☐ ¿Cuántas botellas de Coca hay en total?
How many Coke bottles are there in all?

☐ ¿Cuántas pelotas están sombreadas?
How many baseballs are shaded?

☐ ¿Cuántas pelotas hay en total?
How many baseballs are there in all?



M4 - 4

Instrucciones: Corta 17 triángulos y pónlos dentro de un sobre.

Directions: Cut out 17 triangles and place them in an envelope.

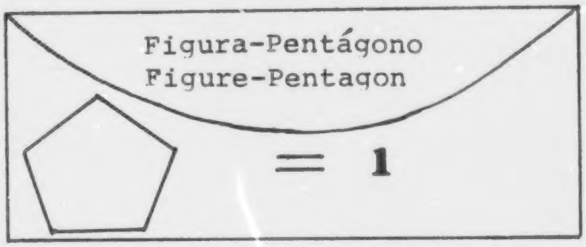
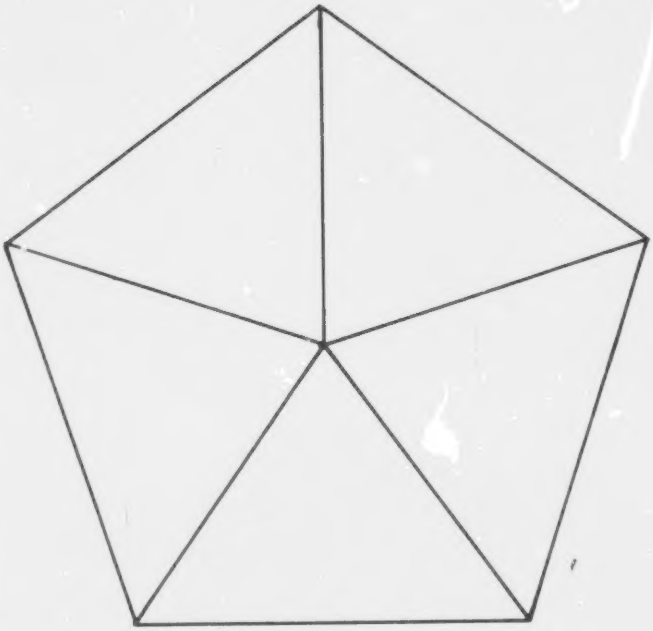
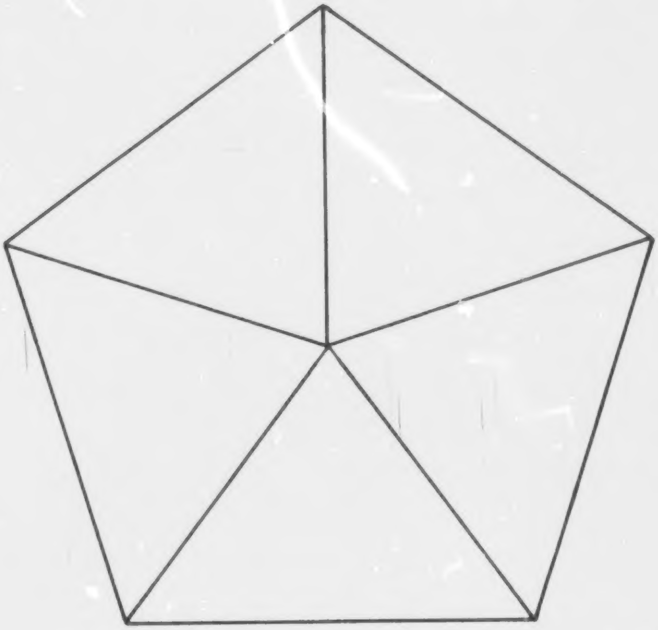
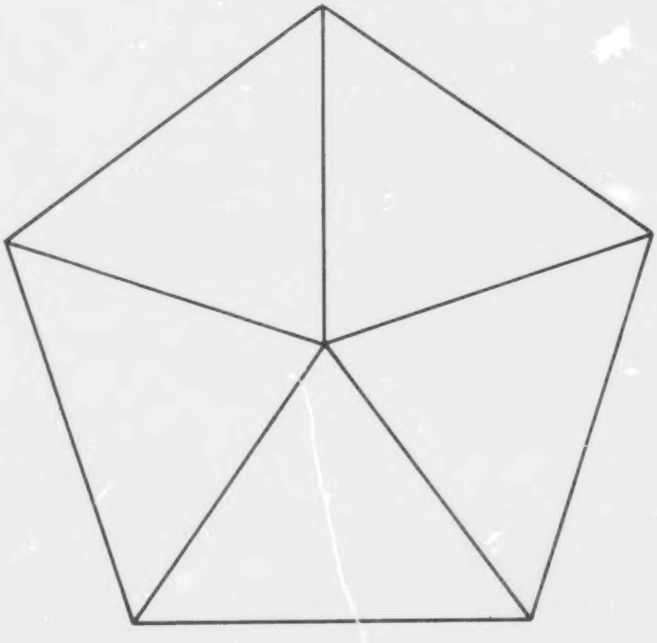
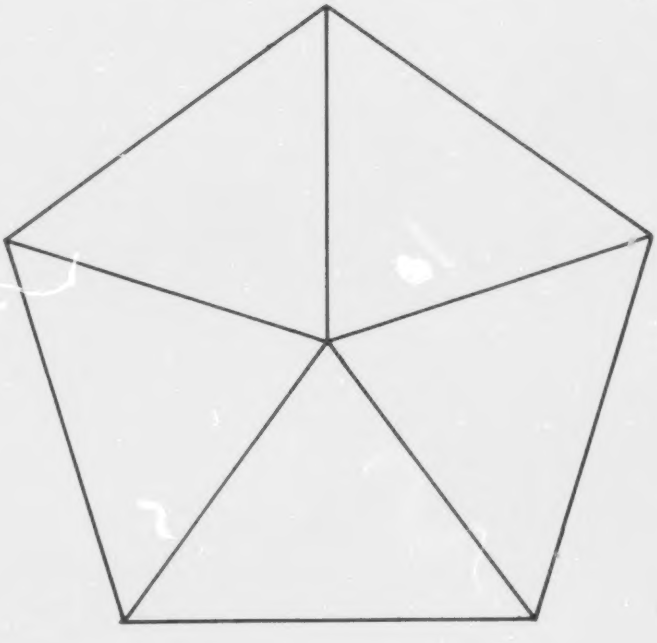


Figura-Pentágono
Figure-Pentagon
= 1









M4 - 5

Instrucciones: Corta 13 triángulos y pónlos dentro de un sobre.

Directions: Cut out 13 triangles and place them in an envelope.

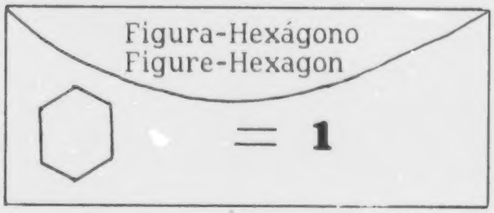
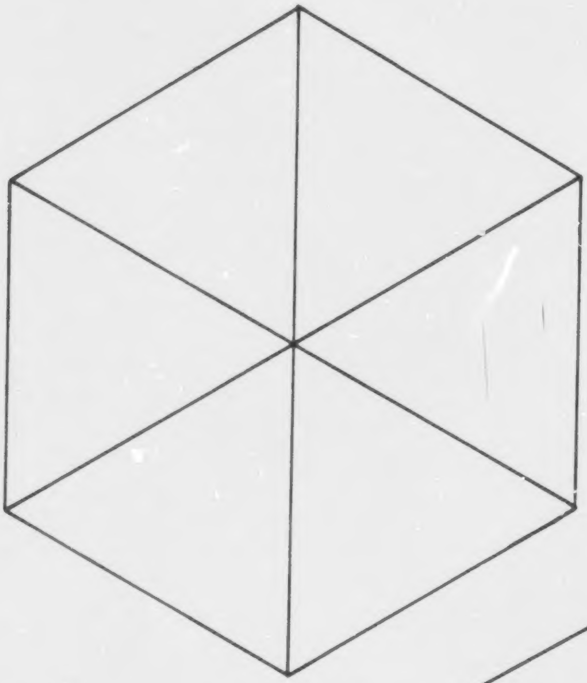
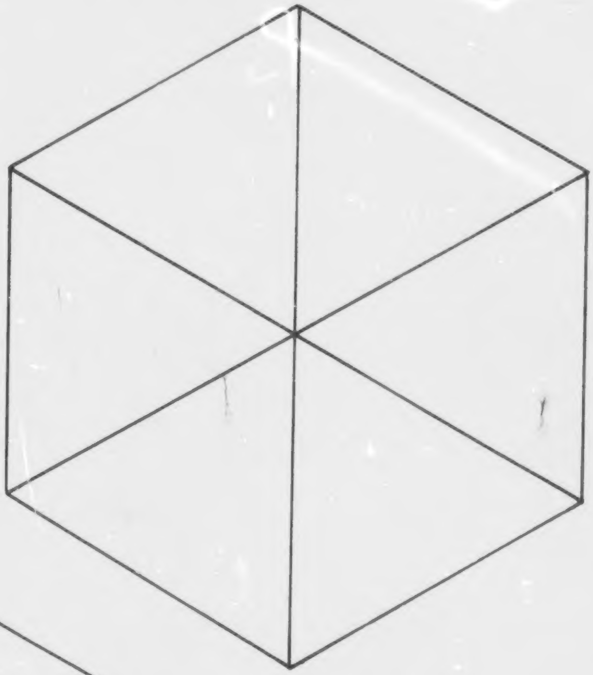
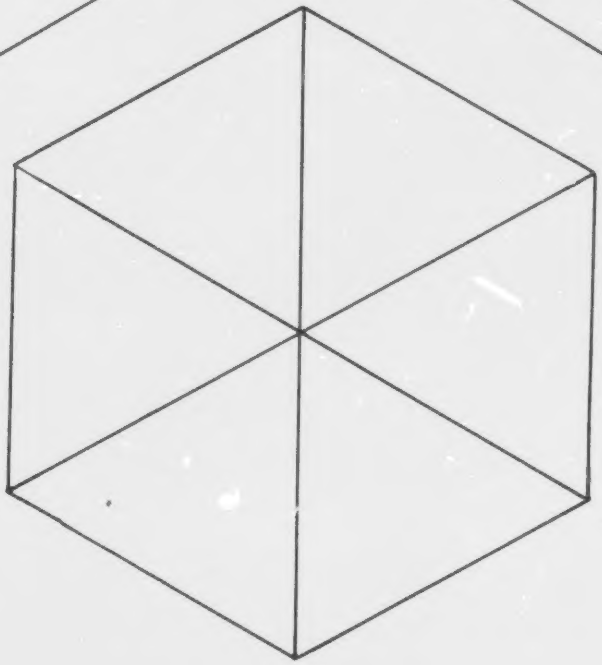


Figura-Hexágono
Figure-Hexagon
= 1







Instrucciones: Corta 21 triángulos y pónlos dentro de un sobre.

Directions: Cut out 21 triangles and place them in an envelope.

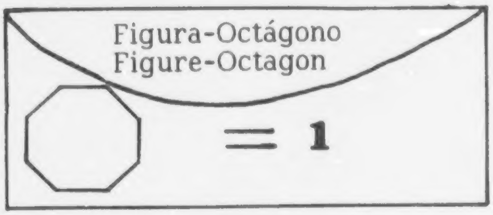
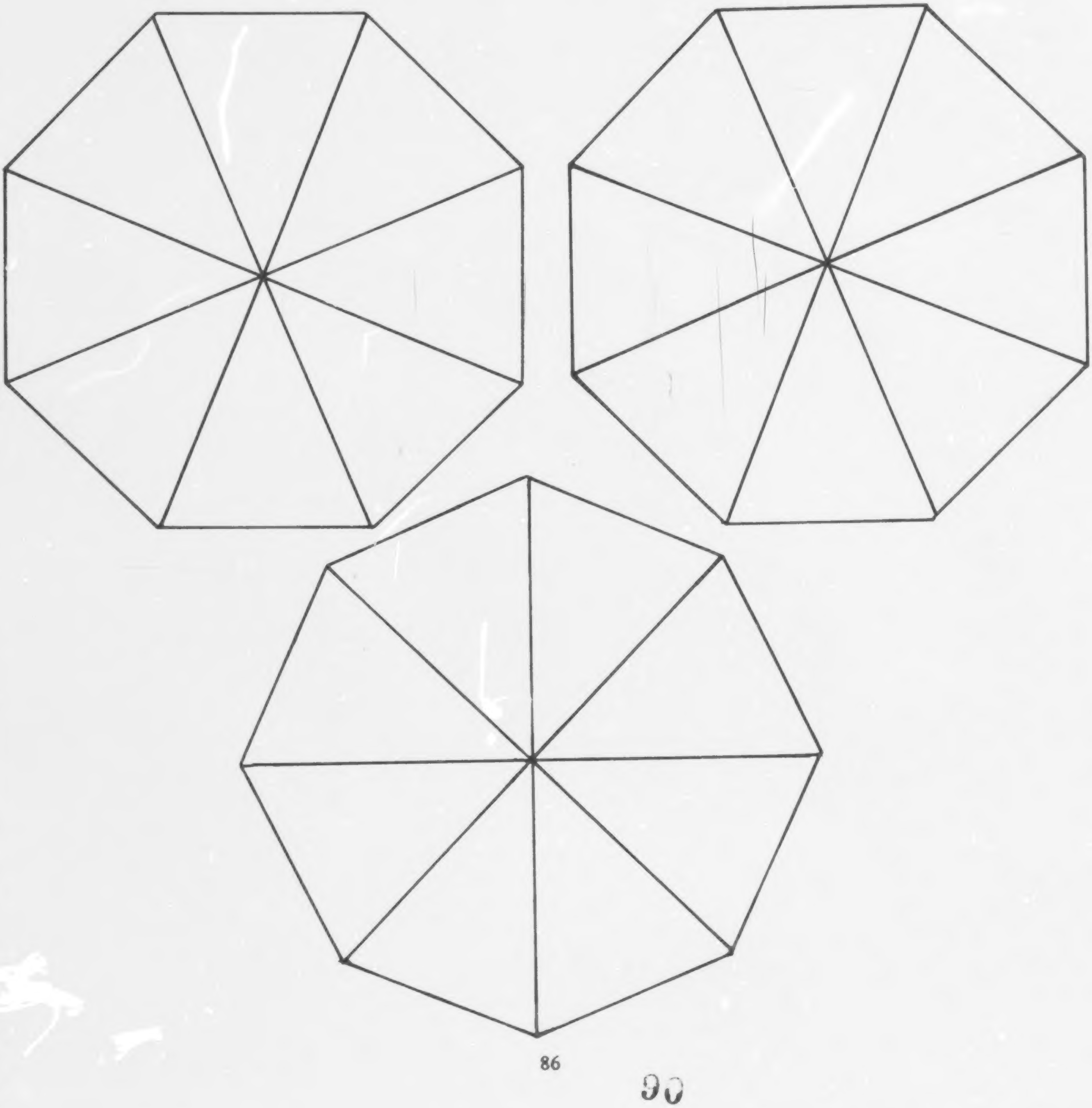


Figura-Octágono
Figure-Octagon
= 1

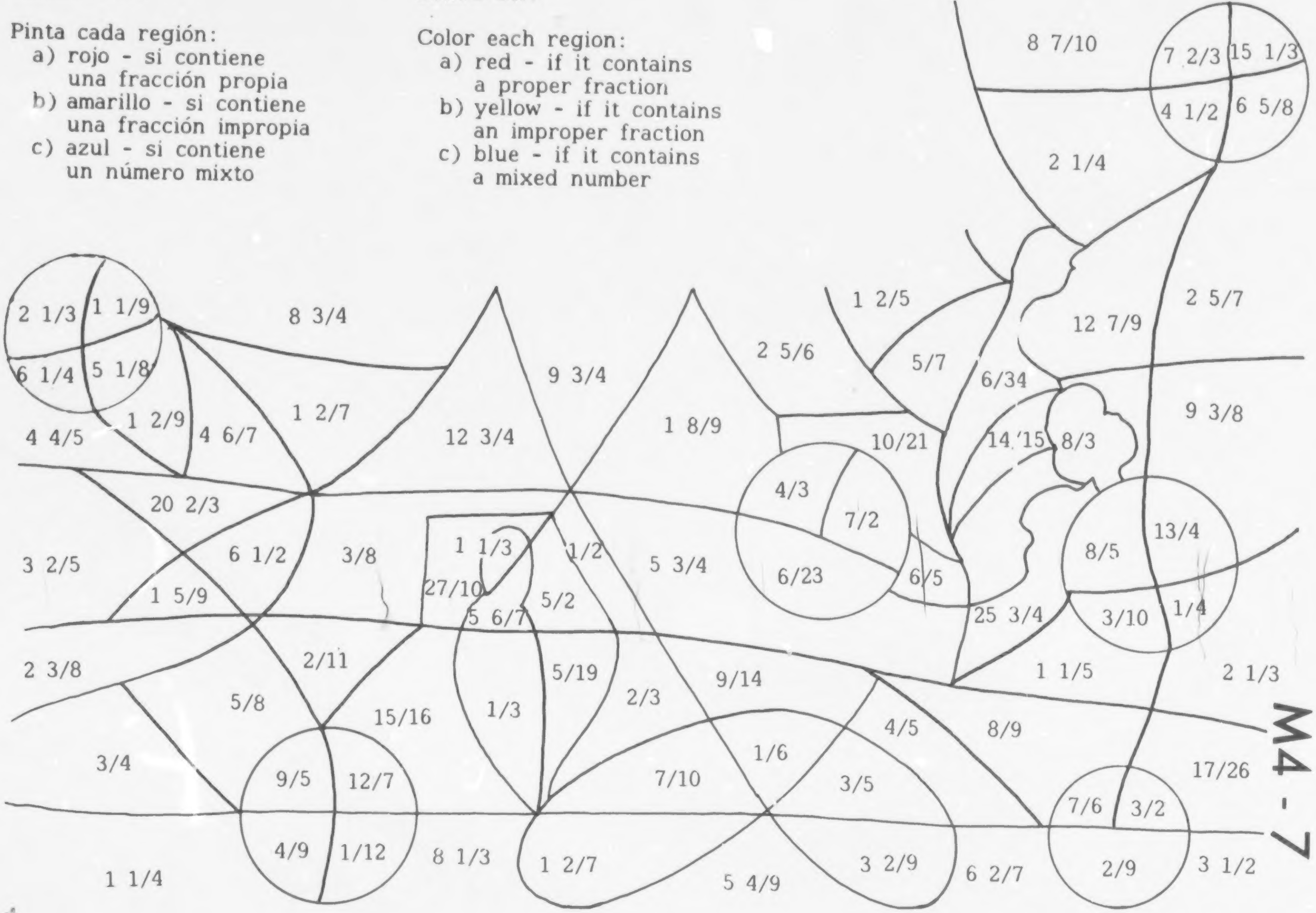


¡DALE GAS!

Pinta cada región:
a) rojo - si contiene una fracción propia
b) amarillo - si contiene una fracción impropia
c) azul - si contiene un número mixto

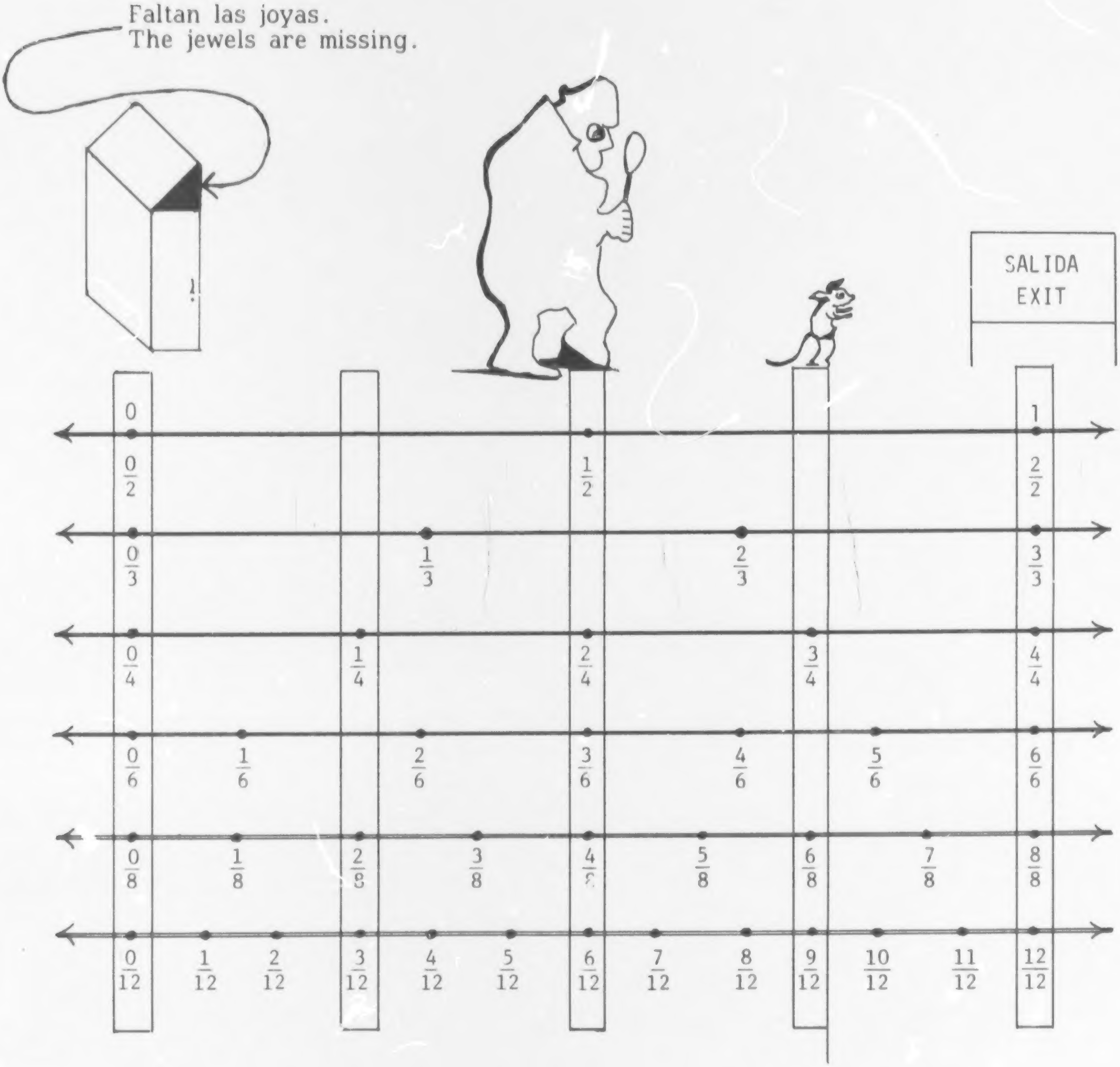
DRAG ON!

Color each region:
a) red - if it contains a proper fraction
b) yellow - if it contains an improper fraction
c) blue - if it contains a mixed number


8 7/10
7 2/3
15 1/3
4 1/2
6 5/8
2 1/4
1 2/5
2 5/7
12 7/9
2 1/3
1 1/9
8 3/4
2 5/6
5/7
6/34
6 1/4
5 1/8
9 3/4
9 3/8
1 2/9
1 2/7
4 4/5
4 6/7
12 3/4
1 8/9
10/21
14/15
8/3
4/3
20 2/3
7/2
13/4
1 1/3
1/2
3 2/5
6 1/2
3/8
5 3/4
8/5
6/23
6/5
27/10
1 5/9
5/2
5 6/7
25 3/4
3/10
1/4
2/11
5/19
2 3/8
9/14
1 1/5
2 1/3
5/8
15/16
1/3
2/3
4/5
8/9
1/6
3/4
7/10
3/5
17/26
9/5
12/7
7/6
3/2
4/9
1/12
8 1/3
1 2/7
3 2/9
6 2/7
2/9
3 1/2
1 1/4
5 4/9

87

M4-7


Faltan las joyas.
The jewels are missing.
SALIDA
EXIT
0 1
0/2 1/2 2/2
0/3 1/3 2/3 3/3
0/4 1/4 2/4 3/4 4/4
0/6 1/6 2/6 3/6 4/6 5/6 6/6
0/8 1/8 2/8 3/8 4/8 5/8 6/8 7/8 8/8
0/12 1/12 2/12 3/12 4/12 5/12 6/12 7/12 8/12 9/12 10/12 11/12 12/12

Fracciones equivalentes en la Recta Numérica

La pantera morada está corriendo hacia la salida llevando las joyas que se ha robado del museo, y el inspector está tratando de capturarla.

1. La pantera ha recorrido 3/4 de la distancia.

   ¿Qué distancia ha recorrido el inspector? ¿Quién está ganado?

2. En la barra debajo del pie de la pantera morada hay tres fracciones iguales que representan la distancia recorrida por ella.

   Escribe el numeral correcto en cada cuadro.

   $$3/4 = \frac{\square}{8} = \frac{\square}{12}$$

3. En la barra debajo del pie del inspector hay fracciones iguales que representan la distancia recorrida por él. Escribe el número correcto en cada cuadro.

   $$1/2 = \frac{\square}{4} = \frac{\square}{8} = \frac{\square}{12}$$

4. Designa dos fracciones que son equivalentes a 1/4.

5. Designa tres fracciones que son equivalentes a 2/2.

6. Designa tres fracciones que son equivalentes a 0/2.

Equivalent Fractions on the Number Line

The purple panther is running towards the exit, carrying the jewels he has stolen from the museum, and the inspector is trying to catch him.

1. The panther has gone 3/4 of the distance.

   How far has the inspector gone?
   Who is winning?

2. The bar underneath the purple panther's foot shows three equal fractions which represent the distance he has gone.

   Write the correct numeral in each box.

   $$3/4 = \frac{\square}{8} = \frac{\square}{12}$$

3. The bar underneath the inspector's foot shows equal fractions which represent the distance he has gone. Write the correct numeral in each box.

   $$1/2 = \frac{\square}{4} = \frac{\square}{8} = \frac{\square}{12}$$

4. Give two fractions that are equivalent to 1/4.

5. Give three fractions that are equivalent to 2/2.

6. Give three fractions that are equivalent to 0/2.

Nombre ______________________________
Name

Hoja de trabajo
Worksheet

Manten la paz

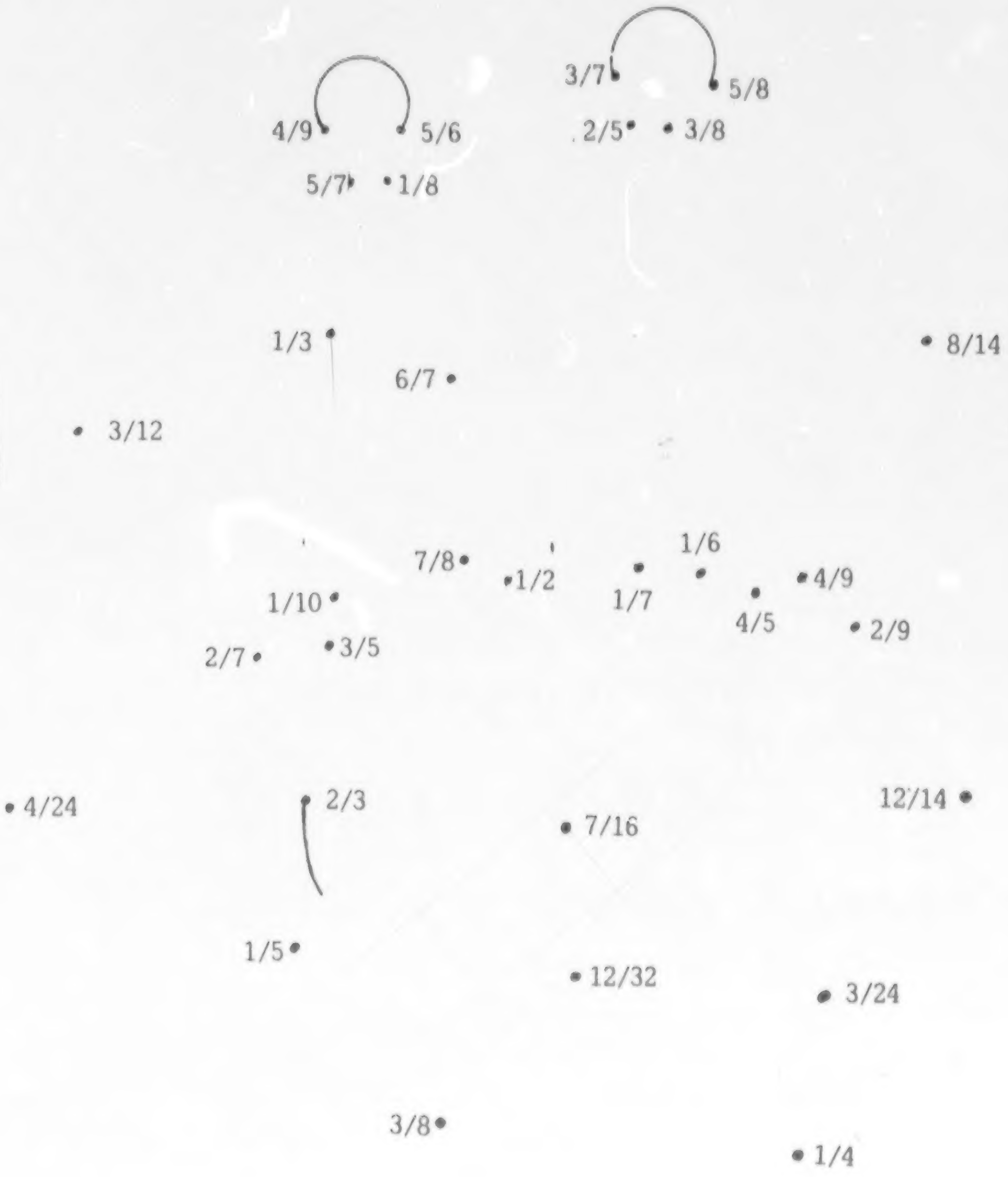
Simplifica las siguientes fracciones. Después, conecta con una línea el punto que corresponde a la respuesta número 1 con el que corresponde a la respuesta número 2, y el punto que corresponde a la respuesta número 2 con el que corresponde a la respuesta número 3, y así sucesivamente. (Algunos de los puntos no se usan.)

Keep the peace

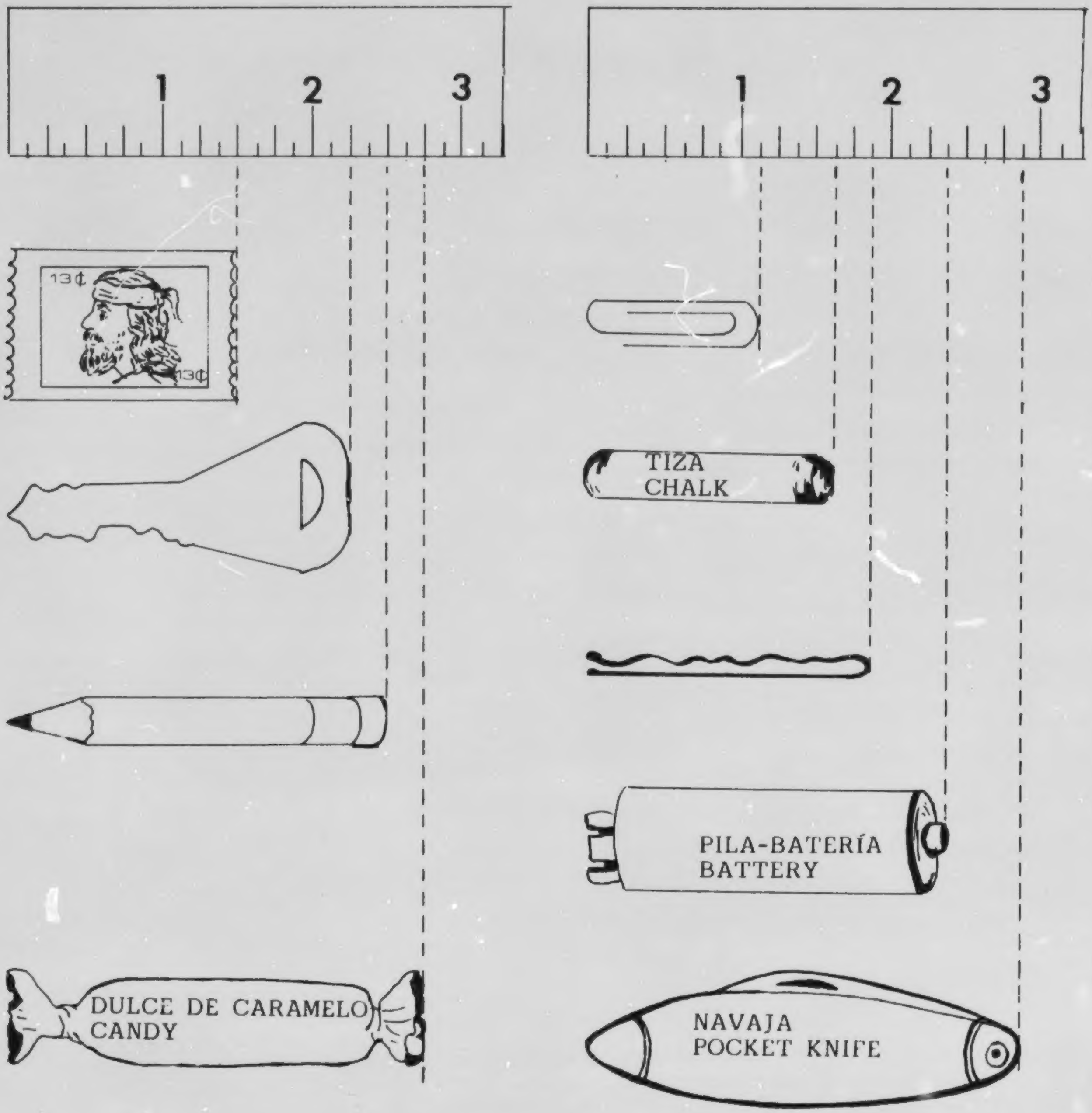
Simplify the following fractions. Then connect the dot corresponding to Answer 1 to the dot corresponding to Answer 2 to the dot corresponding to Answer 2, to the dot corresponding to Answer 3, and so on. (Some of the dots will not be used.)

1. 8/12
2. 18/30
3. 6/21
4. 4/20
5. 6/16
6. 6/24
7. 6/27
8. 16/28
9. 12/15
10. 16/96
11. 3/21
12. 15/24
13. 6/8
14. 8/20
15. 12/28
16. 10/20
17. 14/16
18. 42/49
19. 15/18
20. 5/40
21. 15/21
22. 16/36
23. 30/90
24. 5/50

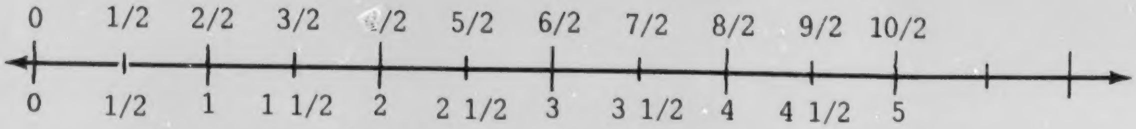
Nombre ______________________ Hoja de trabajo
Name Worksheet

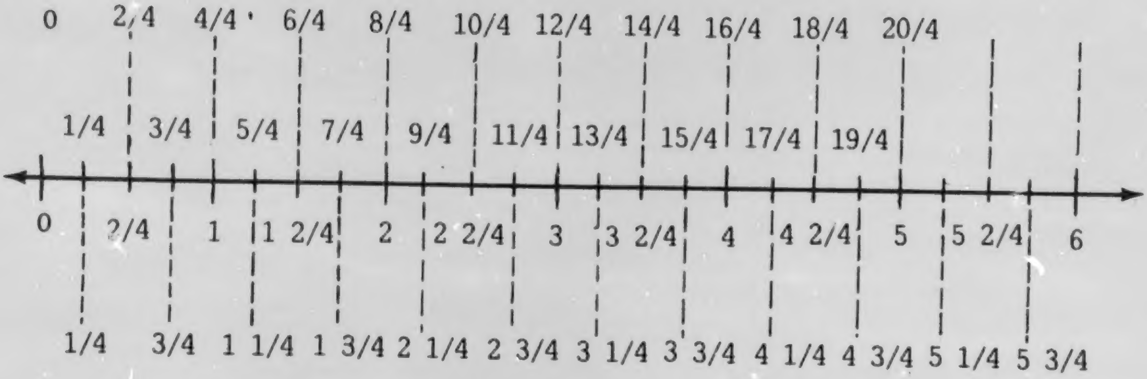

3/7
5/8
4/9
5/6
2/5
3/8
5/7
1/8
1/3
8/14
6/7
3/12
1/6
7/8
1/2
1/7
4/9
1/10
4/5
2/9
2/7
3/5
4/24
2/3
12/14
7/16
1/5
12/32
3/24
3/8
1/4

M4 - 10


1
2
3
13¢
13¢
DULCE DE CARAMELO
CANDY
1
2
3
TIZA
CHALK
PILA-BATERÍA
BATTERY
NAVAJA
POCKET KNIFE

M4 - 11


0
1/2
2/2
3/2
4/2
5/2
6/2
7/2
8/2
9/2
10/2
0
1/2
1
1 1/2
2
2 1/2
3
3 1/2
4
4 1/2
5


0
2/4
4/4
6/4
8/4
10/4
12/4
14/4
16/4
18/4
20/4
1/4
3/4
5/4
7/4
9/4
11/4
13/4
15/4
17/4
19/4
0
2/4
1
1 2/4
2
2 2/4
3
3 2/4
4
4 2/4
5
5 2/4
6
1/4
3/4
1 1/4
1 3/4
2 1/4
2 3/4
3 1/4
3 3/4
4 1/4
4 3/4
5 1/4
5 3/4

Nombre________________________ Hoja de trabajo

Usa el método de eliminación para simplificar las fracciones en cada problema y después multiplica.

En la tabla a la derecha, halla la letra que corresponda a cada respuesta numérica. (Puede ser que algunas respuestas tengan más de una letra correspondiente.)

Después, al fondo de la página, escribe la letra sobre el denominador que sea el mismo que el número del problema. Hazlo de tal modo que exprese un mensaje.

1. 2/3 x 3/4 =
2. 6/8 x 2/5 =
3. 2/3 x 3/18 =
4. 1/10 x 5/7 =
5. 5/16 x 4/5 =
6. 5/8 x 4/5 =
7. 6/7 x 14/18 =
8. 4/21 x 49/32 =
9. 2/3 x 7/16 =
10. 5/7 x 3/10 =
11. 3/9 x 9/21 =
12. 4/5 x 15/16 =
13. 36/8 x 24/24 =
14. 15/16 x 12/25 =

A	1/14
B	3/10
C	2/7
E	1/2
G	4/17
I	3/4
L	1/7
M	3/14
N	9/20
P	3/5
R	5/9
S	7/24
T	2/3
U	1/9
Y	1/4
Z	8/13

8 4 11   12 9 7 6   10 3 5   2 13 1 14

Name__________________________________ Worksheet

Use cancellation to simplify the fractions in each problem and then multiply.

In the chart on the right, find the letter that corresponds to each numerical answer. (In some cases, there may be more than one choice.)

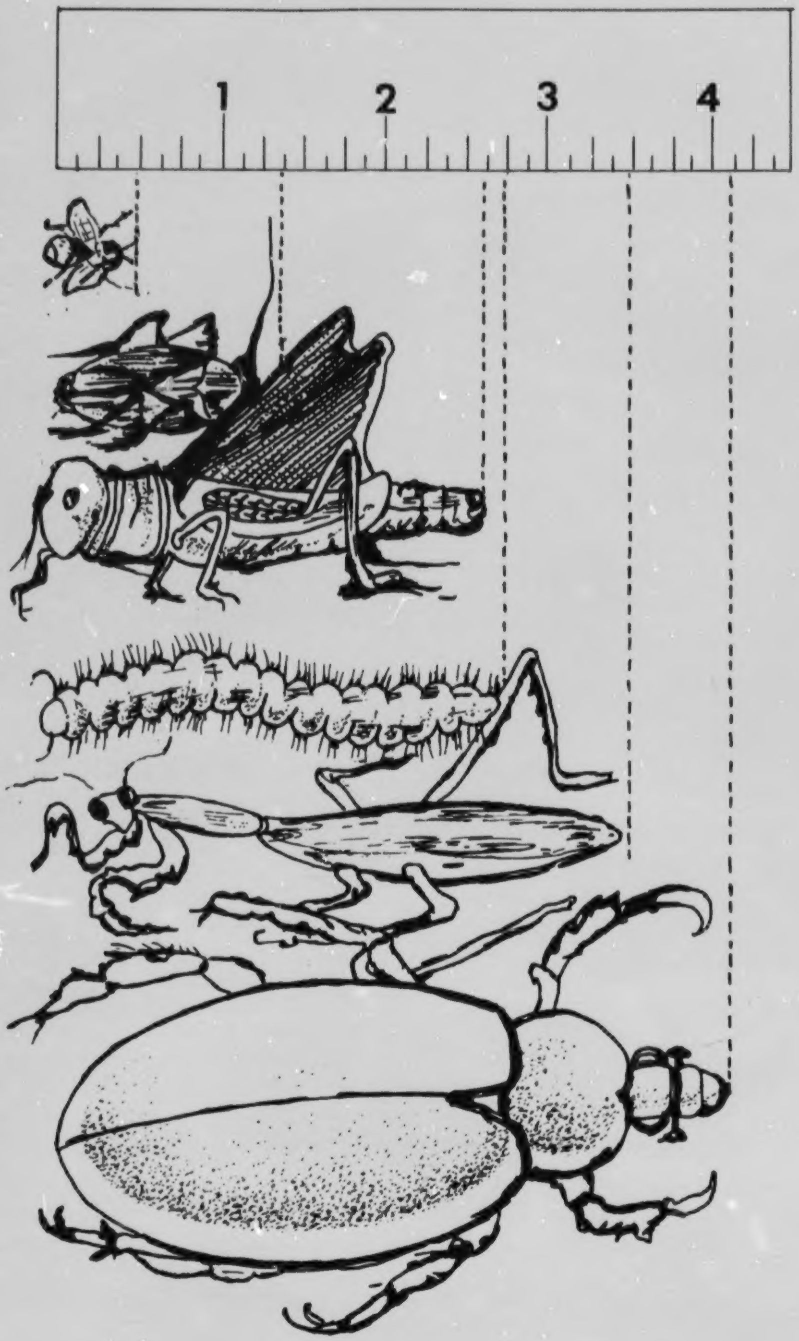
Then, at the bottom of the page, write the letter above the denominator that is the same as the problem number. Do this in such a way that a message is formed.

1. 2/3 x 3/4 =
2. 6/8 x 2/5 =
3. 2/3 x 3/18 =
4. 1/10 x 5/7 =
5. 5/16 x 4/5 =
6. 5/8 x 4/5 =
7. 6/7 x 14/18 =
8. 4/21 x 49/32 =
9. 2/3 x 7/16 =
10. 5/7 x 3/10 =
11. 3/9 x 9/21 =
12. 4/5 x 15/16 =
13. 36/48 x 24/24 =

C	2/7
D	1/2
E	3/4
F	1/11
G	3/14
I	2/3
N	1/7
O	1/14
P	2/4
T	7/24
U	1/9
V	1/2
W	3/16
X	4/17
Y	3/10
Z	8/13

$\frac{\quad}{6}\ \frac{\quad}{4}\ \frac{\quad}{11}\ \frac{\quad}{9}\qquad \frac{\quad}{10}\ \frac{\quad}{7}\ \frac{\quad}{1}\ \frac{\quad}{12}\qquad \frac{\quad}{3}\ \frac{\quad}{5}\qquad \frac{\quad}{2}\ \frac{\quad}{13}\ \frac{\quad}{8}$

M4 - 13



La longitud verdadera de cada insecto es 3/7 de su longitud en este dibujo a escala.

The actual length of each insect is 3/7 of its length on this scale drawing.

Calcula la longitud verdadera de cada insecto.

Find the actual length of each insect.

1) Mosca-fly (Calcula 3/7 x 1/2)
(Find 3/7 x 1/2)

2) Cucaracha-roach

3) Chapulín (slatamontes)
Grasshopper

4) Milípedo-Millipede

5) Mantís religiosa-praying mantis

6) Escarabajo-beetle

M4 - 14 page 1

1. La cabeza humana tiene 28 huesos y la mitad de ellos se encuentran en la cara. ¿Cuántos huesos hay en la cara?

2. Hay 32 dientes y 3/8 de ellos se llaman molares. ¿Cuántos molares hay?

3. Un cuarto de los dientes son incisivos. ¿Cuántos incisivos hay?

4. Las dos manos tienen un total de 28 huesos. Los pulgares contienen 1/4 de ellos y los dedos contienen 6/7 de ellos.

   a. ¿Cuántos huesos hay en los pulgares?
   b. ¿Cuántos huesos hay en los dedos?

5. Los huesos pesan aproximadamente un quinto del peso total del cuerpo humano. Si tu cuerpo pesa 96 libras, ¿cuánto pesan los huesos?

---

1. There are 28 bones in the human head and 1/2 of them are in the face. How many bones are in the face?

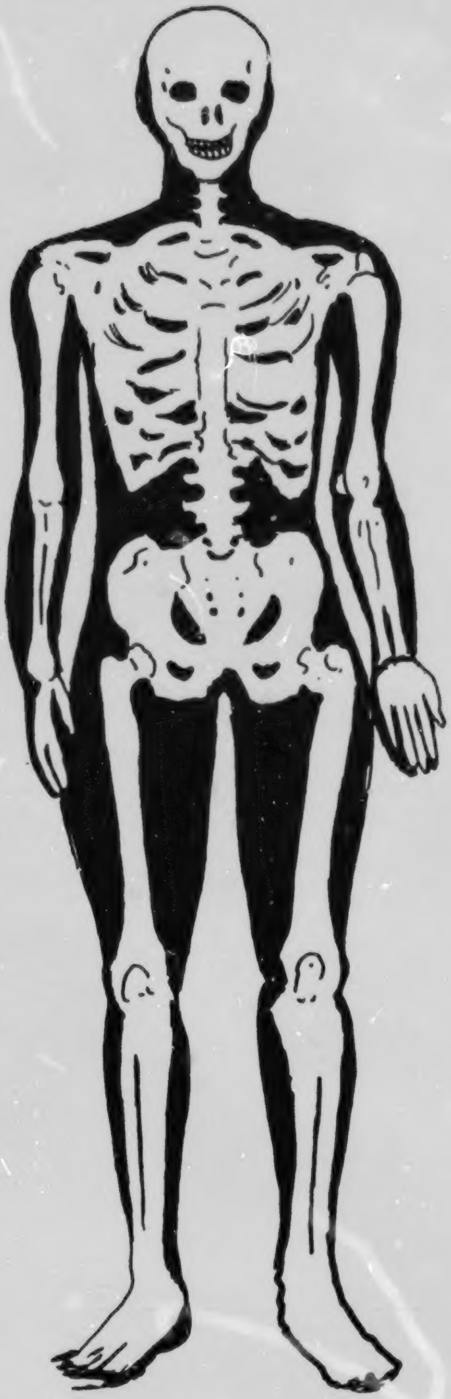
2. There are 32 teeth and 3/8 of them are molars. How many teeth are molars?

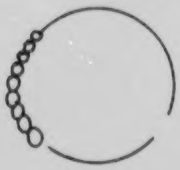
3. One fourth of the teeth are incisors. How many incisors are there?

4. The two hands have a total of 28 bones. The thumbs contain 1/4 of them and the fingers contain 6/7 of them.

   a. How many bones are in the thumbs?
   b. How many bones are in the fingers?

5. About 1/5 of a person's body weight is in bones. If you weigh 96 pounds, how much do your bones weigh?



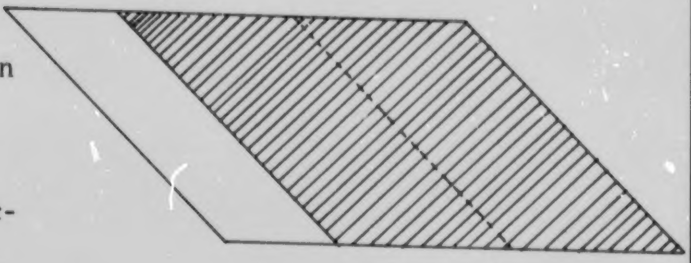


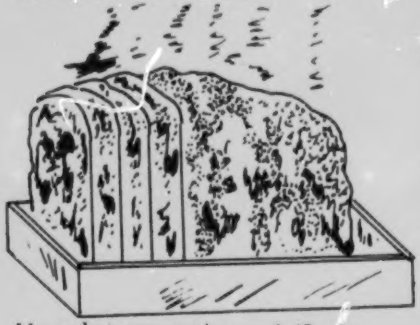
1. ¿Cuántas bolitas de 3/4 pulgada cada una, se necesitarán para formar un brazalete de 9 pulgadas?

How many 3/4-inch beads are needed to make a 9-inch bracelet?

2. Un padre distribuye en partes iguales, entre sus dos hijos, 3/4 de un terreno. ¿Qué fracción del terreno recibirá cada hijo?

A father gives 3/4 of a piece of land to his two sons, dividing it equally between them. What fractional part of the land does each son receive?



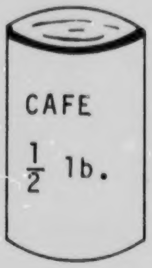


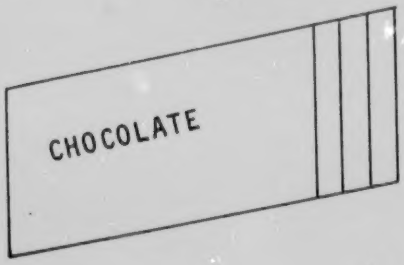
3. Una carne picada y sasonada tiene 10 pulgadas de longitud ¿Cuántas tiras de 5/16 de pulgada cada una se pueden cortar de ella?

A meat loaf is 10 inches long. How many 5/16 inch slices can be cut from it?

4. Una lata contiene 1/2 de una libra de café. El café se va a distribuir en partes iguales entre 4 personas. ¿Cuánto recibirá cada persona?

A can contains 1/2 of a pound of coffee. The coffee is to be distributed equally among 4 persons. How much will each one receive?

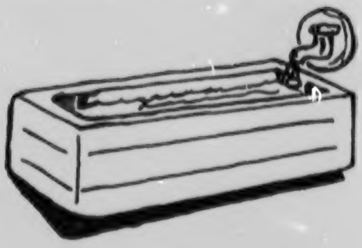




5. Esta barra de chocolate pesa 14 onzas. ¿Cuántas piezas, de 7/8 de onza cada una, se pueden cortar de ella?

This candy bar weighs 14 ounces. If it is divided into pieces weighing 7/8 ounce each, how many pieces will there be?

M4 - 16

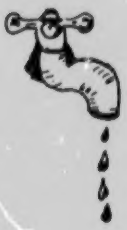


1. El agua en un baño está subiendo 2 3/4 de pulgada por minuto. ¿Cuántos minutos le tardará el agua para subir 15 pulgadas?

   The water in a bathtub is rising 2 3/4 inches per minute. How many minutes will it take the water to rise 15 inches?

2. Una ducha usa 5 1/3 galones de agua cada minuto. ¿En cuántos minutos se usarán 60 galones de agua?

   A shower uses 5 1/3 gallons of water each minute. In how many minutes will 60 gallons of water be used?



3. Una llave gotea 1 1/3 galones de agua por día. ¿Cuántos días tardará en usarse 40 1/2 galones de agua?

   A leaky faucet wastes 1 1/3 gallons of water each day. In how many days will 40 1/2 gallons of water be wasted?

4. Si está saliendo agua de una llave a razón de 14 galones por minuto, ¿cuántos minutos tardará para llenar una tina de 3 1/2 galones?

   If water is coming out of a faucet at the rate of 14 gallons per minute, how many minutes will it take to fill a 3 1/2-gallon bucket?

EXÁMENES/TESTS

NIVEL 4/LEVEL 4

NIVEL 4/EXAMEN 1

Nombre ____________________ Fecha ____________________

Profesor ____________________ Período ____________________

Consejero ____________________ Calificación ____________________

Presenta tu trabajo por escrito.

Simplifica:

1. 25/30
2. 9/6
3. 56/8
4. 14/28

Cambia a fracciones impropias:

5. 5 4/9
6. 7
7. 1 5/8
8. 2 1/6

Cambia a números mixtos o enteros:

9. 49/7 10. 29/5

Multiplica y simplifica:

11. 3/7 x 5/8
12. 27/15 x 10/18
13. 5 1/2 x 3 3/4 x 2/9
14. 1/3 x 5
15. 6 3/4 x 5 1/3

15. 6 3/4 x 5 1/3

16. 1 6/7 x 2/3 x 6 3/4

17. 12 1/4 x 3 3/7 x 1 9/14

18. 5 5/8 x 3/5 x 6

Escribe el recíproco de cada número:

19. 1/6

20. 8

21. 3/4

22. 4 5/7

Divide y simplifica:

23. 5/6 ÷ 4/5

24. 3 3/4 ÷ 7/8

25. 8 ÷ 2/5

26. 5 2/3 ÷ 7 1/2

27. 4 2/3 ÷ 8

28. 12 1/2 ÷ 16 2/3

Resuelve los siguientes problemas y escribe cada respuesta en su forma más simple.

29. Un señor condujo un coche 85 millas en 1 2/3 horas. ¿Cuál fue la velocidad proporcional?

30. Para cubrir una silla de la sala de estar se necesitan 1 1/3 yardas de material (tela). ¿Cuánto material se necesita para cubrir 6 sillas?

LEVEL 4/TEST 1

Name ______________________ Date ______________________

Teacher ______________________ Period ______________________

Advisor ______________________ Score ______________________

Show your work:

Simplify:

1. 25/30
2. 9/6
3. 56/8
4. 14/28

Change to improper fractions:

5. 5 4/9
6. 7
7. 1 5/8
8. 2 1/6

Change to mixed or whole numbers:

9. 49/7
10. 29/5

Multiply and simplify:

11. 3/7 x 5/8
12. 27/15 x 10/18
13. 5 1/2 x 3 3/4 x 2/9
14. 1/3 x 5
15. 6 3/4 x 5 1/3
16. 1 6/7 x 2/3 x 6 3/4
17. 12 1/4 x 3 3/7 x 1 9/14
18. 5 5/8 x 3/5 x 6

NIVEL 4/EXAMEN 2

Nombre ______________________________ Fecha ______________________________

Profesor ______________________________ Período ______________________________

Consejero ______________________________ Calificación ______________________________

Presenta tu trabajo por escrito.

Simplifica:

1. 18/27	3. 14/28
2. 9/3	4. 32/30

Cambia a fracciones impropias:

5. 3 3/4	7. 2 1/7
6. 5	8. 10 3/16

Cambia a números mixtos o enteros:

9. 56/8	10. 31/6

Multiplica y simplifica:

11. 30/32 x 12/50	15. 1 3/4 x 2 5/8
12. 14/21 x 35/42	16. 5 1/8 x 3 2/3 x 1 1/2
13. 3/4 x 5 3/5 x 1/3	17. 1 7/8 x 2 1/3 x 1/5
14. 1/3 x 8 6/7	18. 6 3/8 x 4 x 2/3

Escribe el recíproco de cada número:

19. 1/5	21. 5/7
20. 11	22. 6 3/8

110

Give the reciprocal for each number:

19. 1/6

20. 8

21. 3/4

22. 4 5/7

Divide and simplify:

23. 5/6 ÷ 4/5

24. 3 3/4 ÷ 7/8

25. 8 ÷ 2/3

26. 5 2/3 ÷ 7 1/2

27. 4 2/3 ÷ 8

28. 12 1/2 ÷ 16 2/3

Solve the following problems and write each answer in its simpliest form.

29. A car was driven 85 miles in 1 2/3 hours. What was the average speed per hour?

30. If it takes 1 1/3 yards to cover one living room chair, how much would it take to cover 6 chairs?

Divide y simplifica:

23. 2/3 ÷ 3/4

24. 3 1/8 ÷ 5/8

25. 9 ÷ 3/7

26. 5 3/4 ÷ 5/6

27. 3 1/2 ÷ 14

28. 21 1/2 ÷ 17 1/3

Resuelve los siguientes problemas y escribe cada respuesta en su forma más simple:

29. Yolanda trabaja 1 1/4 horas cada día. ¿Cuántos días le tomará para trabajar 15 horas?

30. Una caja de lápices pesa 1 1/3 libras. ¿Cuántas libras pesarán 7 3/4 cajas de lápices?

LEVEL 4/TEST 2

Name ______________________ Date ______________________

Teacher ______________________ Period ______________________

Advisor ______________________ Score ______________________

Show your work:

Simplify:

1. 18/27
2. 9/3
3. 14/28
4. 32/30

Change to improper fractions:

5. 3 3/4
6. 5
7. 2 1/7
8. 10 3/16

Change to mixed or whole numbers:

9. 56/8
10. 31/6

Multiply and simplify:

11. 30/32 x 12/50
12. 14/21 x 35/42
13. 3/4 x 5 3/5 x 1/3
14. 1/3 x 8 6/7
15. 1 3/4 x 2 5/8
16. 5 1/8 x 3 2/3 x 1 1/2
17. 1 7/8 x 2 1/3 x 1/5
18. 6 3/8 x 4 x 2/3

Give the reciprocal of each number:

19. 1/5
20. 11
21. 5/7
22. 6 3/8

Divide and simplify:

23. 2/3 ÷ 3/4

24. 3 1/8 ÷ 5/8

25. 9 ÷ 3/7

26. 5 3/4 ÷ 5/6

27. 3 1/2 - 14

28. 21 1/2 - 17 1/3

Solve the following problems and write each answer in its simplest form:

29. Susie works 1 1/4 hours each day. How many days will it take her to work 15 hours?

30. One box of pencils weights 1 1/3 pounds. How many pounds would 7 3/4 boxes of pencils weigh?

GEOMETRÍA : CONJUNTOS DE PUNTOS

OVERVIEW OF LEVEL 5A

GEOMETRÍA: CONJUNTO DE PUNTOS

OVERVIEW OF LEVEL 5A

Level 5A begins with a review of sets and set terminology which the student first learned in Level I. This provides a background which will help the student understand the basic geometric concepts (line, line segment, ray, plane, etc.) which are described or defined in terms of sets of points.

BEHAVIORAL OBJECTIVES

1. Given the names of four sets of points, together with six representations of sets of points, the student will match each name with its representation with 75% accuracy.

2. Given a representation of an angle, the student will use mathematical notation to name the angle in two different ways with 100% accuracy.

3. Given a geometric model of intersecting lines, the student will identify the union and/or intersection of various sets of points with 66% accuracy.

4. Given five line segments, and using an English or metric scale as requested, the student will measure the segments to the nearest unit indicated with 80% accuracy.

5. Given four polygons, the student will find the perimeter of each with 75% accuracy.

6. Given a triangle, a square, a rectangle, and a parallelogram, the student will find the area of each with 75% accuracy.

CONTRASTIVE FEATURES

Units of measure of the English system, as well as of the metric system, are used in Booklet 5B to express the measures of geometric figures. Since the metric system of measurement is used in most Hispanic countries, the Hispanic student will need to become familiar with the English system. The teacher's booklet for Level 3 gives suggestions for helping the student develop an understanding of English units of measure.

SETS

LESSON 5A-1

Student Booklet p. 3

CONCEPTS

Definitions of set
Set notation
Definition of subset
Definition of the union of sets
Definition of the intersection of sets

VOCABULARY

común	common
conjunto	set
conjuntos ajenos	disjoint sets
conjunto vacío	emptv set
intersección	intersection
miembro (elemento)	member (element)
subconjunto	subset
unión	union

RESOURCES

1. A group of objects used in the classroom, such as a book, a pencil, a pen, an eraser, a sheet of paper, and a ruler.

2. Transparency M5-1

PROCEDURE

Conjuntos y elementos de conjuntos

Sets and Elements of Sets

Reúna los objetos del salón de clase ya enumerados en el RESOURCE NO. 1 y póngalos sobre el escritorio. Explíqueles a los estudiantes que éste es un grupo o una colección de objetos y que se llama conjunto.

Gather the classroom objects listed in Resource No. 1 and place them on the desk. Explain that this is a group or collection of objects and is called a set.

Levante diferentes objetos de la colección e indique que cada uno

Hold up different objects in the collection and point out that each

se llama miembro del conjunto. Haga que los estudiantes den ejemplos de otros objetos en el salón de clase que no sean miembros de este conjunto.

Escoja un grupo de estudiantes de la clase (por ejemplo, los estudiantes de cierta fila) y designe este grupo como un conjunto. Después, haga que los estudiantes nombren las personas que son miembros de este conjunto y otras que no lo son.

Después que los estudiantes hayan comprendido bien el concepto de conjuntos cuyos miembros sean objetos concretos, use la transparencia M5-1 para introducir conjuntos cuyos miembros sean números o letras del alfabeto. Explíqueles cómo leer la notación de conjuntos. Por ejemplo, (a, b, e, f, v, m) se lee: "el conjunto cuyos miembros son a, b, e, f, v, m".

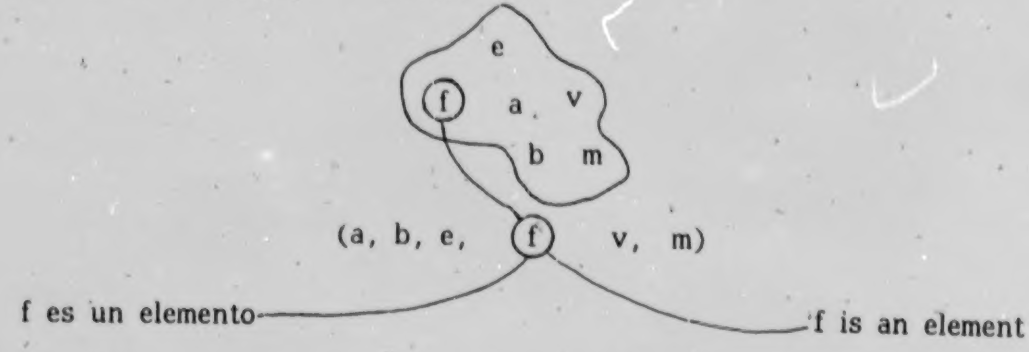
Escoja ejemplos de letras o números que sean elementos de los conjuntos, escribiéndolos en la transparencia como se demuestra en el siguiente ejemplo.

is called a member of the set. Have the students give examples of other objects in the classroom which are not members of this set.

Select a group of students in the classroom (for example, the students in a particular row) and designate this group to be a set. Then have the students name persons who are members of this set and others who are not members.

After the students are familiar with sets whose members are concrete objects, use transparency M5-1 to introduce sets whose members are numbers or letters of the alphabet. Explain how to read set notation. For example, (a, b, e, f, v, m,) is read, "the set whose members are a, b, e, f, v, m."

Select examples of letters or numbers of the sets, writing them on the transparency as the following example illustrates.



Subconjuntos

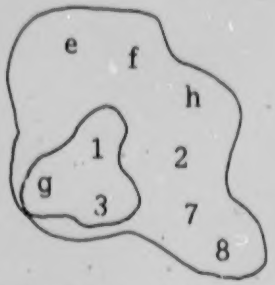
Escoja dos o tres objetos del conjunto de los objetos salón de clase, ya enumerados en RESOURCE NO. 1. Póngalos en un grupo aparte, explicando que ellos forman parte de un subconjunto del conjunto dado. Defina el término subconjunto y haga que los estudiantes formen otros subconjuntos del conjunto dado.

En la transparencia M5-1, escoja varios elementos de uno de los conjuntos, e identifique este grupo como un subconjunto.

Subsets

Select two or three of the objects from the set of classroom objects listed in Resource No. 1. Place them in a separate group, explaining that they are a subset of the given set. Define the term subset and have the students form other subsets of the given set.

On transparency M5-1, select several elements of one of the sets, and identify this group as a subset.



conjunto - (e, f, g, h. 1, 2, 3, 7, 8)

subconjunto - (g, 1, 3) - subset

Haga que los estudiantes den otros ejemplos de subconjuntos de los conjuntos dados.

Have the students give other examples of subsets of the given sets.

Unión de conjuntos

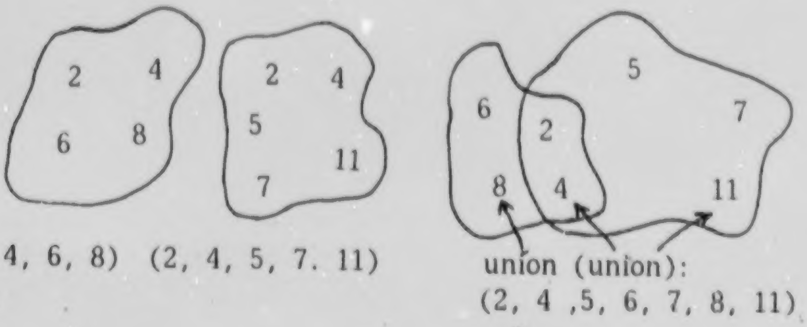
Divida los objetos enumerados en el RESOURCE NO. 1 en dos conjuntos. Después de mostrar estos dos conjuntos a los estudiantes, haga que un estudiante

Union of Sets

Divide the objects listed in Resource No. 1 into two sets. After showing these two sets to the students have a student push all of the objects together, forming one

ponga todos los objetos juntos, formando un sólo conjunto. Explíqueles que este conjunto es la unión de los dos conjuntos dados. Defina unión de conjuntos y use la transparencia M5-1 para presentar otros ejemplos de unión.

set. Explain that this set is the union of the two given sets. Define union of sets and use transparency M5-1 to give other examples of union.



En la pizarra, escriba ejemplos de dos conjuntos cuyos miembros sean estudiantes de la clase, escogiendo conjuntos en los cuales hayan algunos miembros en común.

Por ejemplo:
(José, Miguelito, Carmen, Mark, Rosa).

(Enrique, Carmen, Tomás, José).

Explíqueles que, siendo José y Carmen comunes a los dos conjuntos, (José, Carmen) es intersección de los conjuntos dados.

Defina intersección de conjuntos y use la transparencia M5-1 para presentar otros ejemplos de intersección.

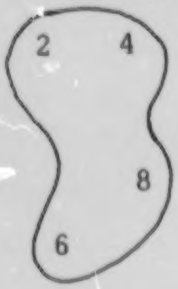
On the chalkboard, write examples of two sets whose members are students of the class, selecting sets which have some members in common.

For example,
(Joe, Mike, Carmen, Mark, Rose)

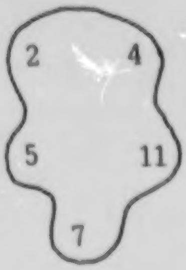
(Henry, Carmen, Tom, Joe)

Explain that since Joe and Carmen are common to both sets, (Joe, Carmen) is the intersección of the given sets.

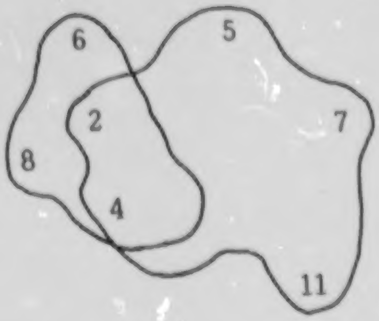
Define intersection of sets and use transparency M5-1 to give other examples of intersection.



(2, 4, 6, 8)



(2, 4, 5, 7, 11)



intersección:
(intersection)
(2, 4)

POINTS, LINE SEGMENTS, AND LINES
RAYS AND OPEN HALF-LINES
PLANES AND SPACE

LESSONS 5A-2, 5A-3, 5A-4

Student Booklet p. 7

CONCEPTS

Point
Line segment
Line
Ray
Open half-line
Plane
Space

VOCABULARY

camino	path
cortar (intersectar)	to intersect
espacio	space
plano	plane
punto	point
punto extremo (o extremo)	endpoint
rayo	ray
recta	line
segmento de recta	line segment
semirrecta abierta	open half-line

RESOURCES

1. Pencils or straws (to represent lines)
2. Several sheets of construction paper of cardboard (to represent planes)

PROCEDURE

Describa el punto como una posición fija en el espacio. Explíqueles que usualmente se representa por una marca pequeña y que se designa por una letra mayúscula.

Describe a point as a fixed location in space. Explain that it is usually represented by a dot and is named by a capital letter.

Represente dos puntos, colocando dos marcas en la pizarra. Haga que varios estudiantes conecten los puntos. La mayoría de ellos los conectarán usando el camino más directo, es decir, un segmento de recta.

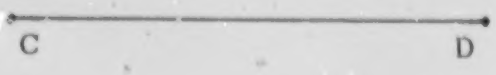
Represent two points by placing two dots on the chalkboard. Ask several students to connect the points. Most students will connect them by using the most direct path, that is, a line segment.

Represente varios segmentos de recta en la pizarra y presente la notación matemática que designa un segmento de recta.

Represent several line segments on the chalkboard and show the mathematical notation for a line segment.

Para presentar el concepto de recta, comience por representar un segmento de recta en la pizarra.

To present the concept of a line, begin by representing a line segment on the chalkboard.



Extienda el segmento de recta a través de los dos puntos extremos de modo que un segmento de recta sea representado.

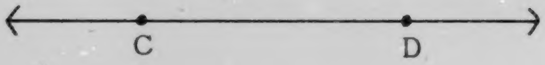
Extend the line segment through both endpoints so that a line segment is represented.

Coloque flechas como se muestra en el siguiente diagrama, explicando que ellas significan que

Place arrows as the following diagram illustrates, explaining that they mean that a line extends end-

una recta puede extenderse indefinidamente en ambas direcciones.

lessly in both directions.

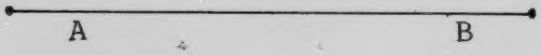


Explíqueles la notación matemática para una línea y haga que los estudiantes representen varios ejemplos de rectas en la pizarra.

Para representar el concepto de un rayo, represente un segmento de recta en la pizarra.

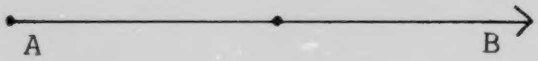
Explain the mathematical notation for a line, and have the students represent several examples of the line on the chalkboard.

To present the concept of a ray, represent a line segment on the board.



Extiéndalo en una dirección solamente de manera que un rayo sea representado.

Extend it in only one direction so that a ray is represented.

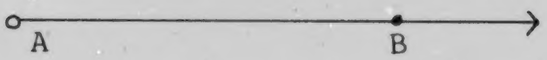


Explíqueles la notación matemática por medio de un rayo y haga que los estudiantes dibujen varios ejemplos de rayos en la pizarra.

Represente una semirrecta/abierta en la pizarra y descríbala como una raya sin un punto extremo.

Explain the mathematical notation for a ray and have the students represent several examples of rays on the chalkboard.

Represent an open half-line on the chalkboard and describe it as a ray without an endpoint.



Explíqueles la notación matemática para una semirrecta abierta.

Repase la notación matemática para todos los conjuntos de puntos presentados en esta lección.

Ud. necesitará poner énfasis en los diferentes símbolos y sus significados, ya que muchos estudiantes encuentran difícil recordarlos.

Describa el concepto de un plano usando papel de construcción (o cartón) y lápices para representar planos y rectas. Defina espacio como el conjunto de todos los puntos.

Explain the mathematical notation for an open half-line.

Review the mathematical notations for all the sets of points presented in this lesson.

You will need to emphasize the different symbols and their meaning, since many students find it difficult to remember them.

Describe the concept of a plane, using sheets of construction paper (or cardboard) and pencils to represent planes and lines. Define space as the set of all points.

UNION OF SETS
ANGLES
INTERSECTION OF SETS

LESSON 5A-5, 5A-6, 5A-7

Student Booklet p. 33

CONCEPTS

Union of sets of points
Definition of angle
Intersection of sets of points

VOCABULARY

ángulo	angle
intersección	intersection
lado	side
unión	union
vértice	vertex

RESOURCES

A transparency sheet and transparency marking pens of different colors

PROCEDURE

Unión de conjuntos de puntos

Repase la definición de unión de conjuntos recordando a los estudiantes que la unión de dos conjuntos es el conjunto de elementos que pertenece a uno u otro o a ambos conjuntos.

Use cualquiera de los dos siguientes métodos para demonstrarles cómo encontrar la unión de conjuntos de puntos.

Método 1

Use una transparencia y marcadores de transparencia de diferentes colores.

Union of Sets of Points

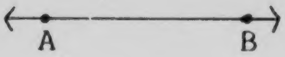
Review the definition of union of sets, reminding the students that the union of two sets is the set of elements which belong to one or the other or both sets.

Use either of the following two methods to demonstrate how to find the union of sets of points.

Method 1

Use a transparency and transparency marking pens of different colors.

Ejemplo - Example



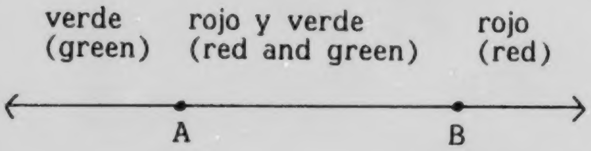
$\overrightarrow{AB} \cup \overrightarrow{BA} = ?$

Pinte $\overrightarrow{AB}$ rojo

y BA verde

Color $\overrightarrow{AB}$ red

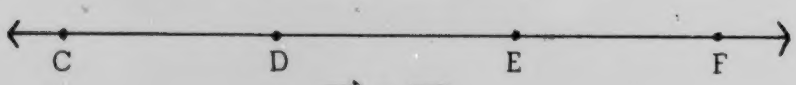
and BA green



Todo lo que está pintado en el dibujo representa $\overrightarrow{AB} \cup \overrightarrow{BA} = \overleftrightarrow{AB}$

Everything in the drawing that is colored representes $\overrightarrow{AB} \cup \overrightarrow{BA} = \overleftrightarrow{AB}$.

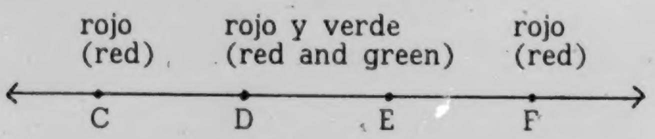
Ejemplo - Example



$\overrightarrow{CF} \cap \overline{DE} = ?$

Pinte $\overrightarrow{CF}$ rojo y $\overline{DE}$ verde.

Color $\overrightarrow{CF}$ red and $\overline{DE}$ green.



Todo le que está pintado en el dibujo representa $\overleftrightarrow{CF} \cup \overline{DE} = \overleftrightarrow{CF}$

Everything in the drawing that is colored represents $\overleftrightarrow{CF} \cup \overline{DE} = \overleftrightarrow{CF}$

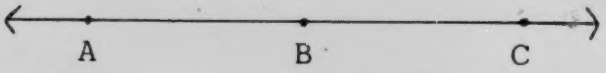
Método 2

Use una transparencia y un marcador de transparencias. (No es necesario usar marcadores de colores).

Method 2

Use a transparency and a marking pen (Colored pens are not needed.)

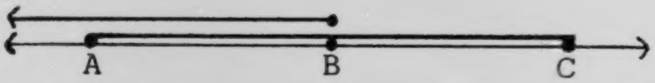
Ejemplo - Example



$\overline{AC} \cup \overline{BC} = ?$

Represente $\overline{AC}$ trazándola sobre la recta. Después represente $\overrightarrow{BA}$ trazándola de la recta.

Represent $\overline{AC}$ by tracing on the line. Then represent $\overrightarrow{BA}$ by tracing above the line.



Todo lo que se ha trazado en el dibujo representa $\overline{AC} \cup \overrightarrow{BA} = \overrightarrow{CA}$.

Everything in the drawing that has been traced represents $\overline{AC} \cup \overrightarrow{BA} = \overrightarrow{CA}$.

Ángulo

En una transparencia represente dos rayos que tengan un punto extremo común. Explíqueles que éste es un ángulo y señale el vértice y los lados.

Angle

On a transparency represent two rays which have a common endpoint. Explain that this is an angle and point out the vertex and the sides.

Explíqueles la notacíon matemática para un ángulo y muestre a los estudiantes como designar un ángulo.

Explain the mathematical notation for an angle and show the students how to name an angle.

Intersección de conjuntos de puntos

Intersection of Sets of Points

Repase la definición de la intersección de conjuntos, recordando a los estudiantes que la unión de dos conjuntos es el conjunto de miembros comunes a ambos conjuntos.

Review the definition of the intersection of sets, reminding the students that the union of two sets is the set of members common to both sets.

Use uno de los dos métodos siguientes para demostrarles a los estudiantes cómo encontrar la intersección de conjuntos de puntos.

Use either of the following two methods to demonstrate how to find the intersection of sets of points.

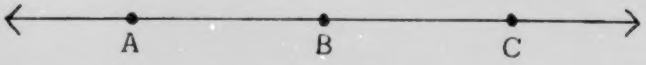
Método 1

Method 1

Use una transparencia y marcadores de transparencias de diferentes colores.

Use a transparency and transparency marking pens of different colors.

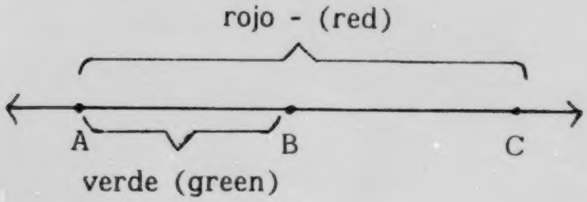
Ejemplo - Example



$$\overrightarrow{AC} \cap \overrightarrow{BA} = ?$$

Pinte $\overrightarrow{AC}$ rojo y $\overrightarrow{BA}$ verde.

Color $\overrightarrow{AC}$ red and $\overrightarrow{BA}$ green.

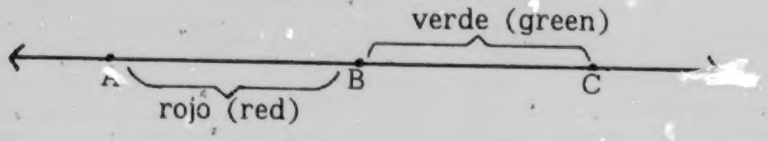


La porción del dibujo que está pintado, tanto la roja como la verde, representa $\overrightarrow{AC} \cap \overrightarrow{BA} = \overline{AB}$

The portion of the drawing that is colored both red and green represents $\overrightarrow{AC} \cap \overrightarrow{BA} = \overline{AB}$

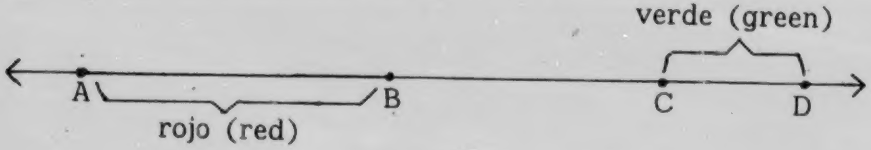
Ejemplo - Example

$$\overrightarrow{BC} \cap \overrightarrow{BA} = B$$



Ejemplo - Example

$$\overrightarrow{CD} \cap \overrightarrow{BA} = \emptyset$$



Puesto que ninguna porción del dibujo está pintada en ambos colores rojo y verde, la intersección es el conjunto vacío.

Since no portion of the drawing is colored both red and green, the intersection is the empty set.

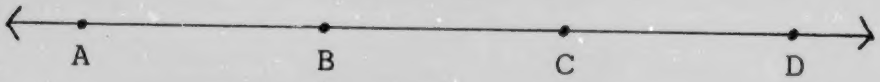
Método 2

Use una transparencia y un marcador. (No se necesitan marcadores de colores).

Method 2

Use a transparency and a marking pen. (Colored pens are not needed.)

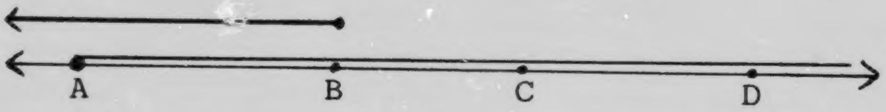
Ejemplo - Example



$$\overrightarrow{AB} \cap \overrightarrow{BA} = ?$$

Represente AB trazándolo sobre la recta. Entonces represente BA trazándolo arriba de la recta.

Represent AB by tracing on the line. The represent BA by tracing above the line.



La porción del dibujo que ha sido trazado dos veces representa

The portion of the drawing that has been traced twice represents

$\overrightarrow{AB} \cap \overrightarrow{BA} = \overline{AB}$ $\overrightarrow{AB} \cap \overrightarrow{BA} = \overline{AB}$

PLANE INTERSECTION

LESSON 5A-8

Student Booklet p. 47

CONCEPT

Intersection of planes

VOCABULARY

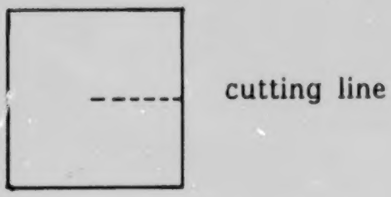
cortar (intersectar)	intersect
infinito	infinite
intersección	intersection
paralelo	parallel
plano	plane
recta	line

RESOURCES

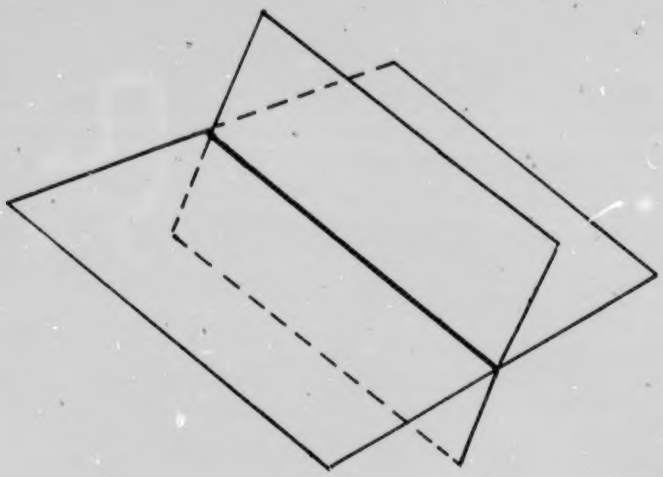
1. Several sheets of construction paper
2. Pencils or drinking straws

PROCEDURES

Directions: Beginning midway between the upper and lower edge of each of two sheets of construction paper, and maintaining a cutting line parallel to the upper and lower edges, cut each sheet halfway across.



1. Place the sheets together, anchoring them in position with scotch tape, so that they form intersecting planes.



2. Using a similar procedure, make representations of the geometric figures illustrated in Lesson 5A-8 of the student's booklet, or have the students make them.

Usando papel de construcción y lápices o pajillas (popotes), haga representaciones de las figuras geométricas de la Lección 5A-8. Muéstrelas a los estudiantes, explicándoles las relaciones geométricas que ellos demuestran. Ponga énfasis en el hecho de que:

1. Dos planos se cortan en una recta.
2. Una recta y un plano pueden cortarse en un punto.

Using construction paper and pencils or drinking straws, make representations of the geometric figures of Lesson 5A-8. Show these to the class, explaining the geometric relationships which they illustrate. Emphasize the fact that:

1. Two planes intersect in a line.
2. A line and a plane may intersect in a point.

MEDIDA LINEAL, PERÍMETRO Y ÁREA

OVERVIEW OF LEVEL 5B

MEDIA LINEAL, PERÍMETRO Y ÁREA

OVERVIEW OF LEVEL 5B

Level 5B includes practice in measuring line segments, using both the English and the metric systems. It also includes a study of the perimeter of polygons and the area of rectangles, triangles, and parallelograms.

MEASURING AND MEASUREMENTS
MEASURING LINE SEGMENTS
PRACTICE IN USING THE RULER

LESSONS 5B-1, 5B-2, 5B-3

Student Booklet p. 3

CONCEPTS

Measurement and units of measure
Measuring line segments
Using the English and metric scales

VOCABULARY

centímetro	centimeter
decímetro	decimeter
longitud	length
medida	measure
milímetro	millimeter
milla	mile
pie	foot
pulgada	inch
regla	ruler
unidad de medida	unit of measure
yarda	yard

RESOURCES

1. Copies of the rulers shown on M5-2 for each student
2. Teacher-made transparency having representations of line segments of different lengths

PROCEDURE

Usando RESOURCE NO. 2 y una regla de plástico transparente, mida varios segmentos de recta a la pulgada más cercana, a la 1/2 pulgada más cercana, al 1/8 de pulgada más cercana y al centímetro más cercano.

Explíqueles cómo redondear una medida a la unidad indicada más cercana. Déle a cada estudiante una copia de las reglas sacadas del Modelo M5-2.

Prepare una transparencia mostrando segmentos de recta de diferentes longitudes o dé a los estudiantes una lista de objetos de diversas longitudes los cuales se pueden encontrar en el salón de clase. Haga que los estudiantes midan la longitud de los objetos (o de los segmentos de recta) lo más cerca posible de la pulgada, la 1/2 pulgada, el 1/4 pulgada, el 1/8 pulgada, y el centímetro.

La tabla siguiente puede ayudar a los estudiantes a apuntar sus medidas.

Using RESOURCE NO. 2 and a transparent plastic ruler, measure several line segments to the nearest inch, the nearest 1/4 inch, the nearest 1/8 inch, and the nearest centimeter.

Explain how to round a measure to the nearest unit indicated. Give each student a copy of the rulers made from Pattern M5-2.

Either prepare a transparency showing line segments of different lengths or give the students a list of classroom objects of different lengths. Have the students measure the lengths of the line segments (or the objects) to the nearest inch, 1/2 inch, 1/4 inch, 1/8 inch, and centimeter.

The students may find it helpful to use a chart such as the following to record their measurements.

MEDIDA - MEASURE					
OBJETO OBJECT	1 pulgada 1 inch	1/2 pulgada 1/2 inch	1/4 pulgada 1/4 inch	1/8 pulgada 1/8 inch	1 centímetro 1 centimeter

PERIMETER
PERIMETER OF RECTANGLES

LESSONS 5B-4, 5B-5

Student Booklet p. 25

CONCEPTS

Right angle
Definition of a rectangle
Definition of a square
Perimeter of polygons

VOCABULARY

anchura	width
ángulo recto	right angle
cuadrado	square
longitud	length
perímetro	perimeter
rectángulo	rectangle

RESOURCES

1. Several sheets of construction paper of two different colors
2. Scotch tape
3. Scissors

PROCEDURE

Para introducir el concepto de rectángulo, haga que los estudiantes construyan la representación de un rectágulo por medio de la siguiente actividad. Explíque y demuestre la actividad, deteniéndose despues de cada paso para darles tiempo a los estudiantes a ejecutarlo.

To introduce the concept of rectangle, have the students construct a representation of a rectangle by carrying out the following activity. Explain and demonstrate the activity, pausing after each step to allow the students to perform it.

134

Paso 1

Corte una tira de papel de una pulgada de anchura de cada una de las dos piezas de papel de construcción de diferentes colores. (Nota: Si Ud. usa dos tiras de la misma longitud, la figura resultante será la de un rectángulo que es un cuadrado. Si las tiras tuvieran diferentes longitudes, la figura será un rectángulo que no es un cuadrado.)

Step 1

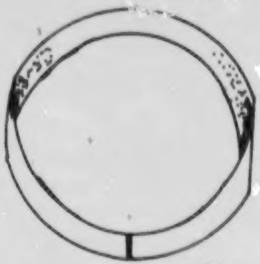
Cut a strip of paper an inch wide from each of two pieces of construction paper of different colors. (Note. If you use two strips equal length, the resulting figure will be a rectangle which is a square. If the strips have different lengths, the figure will be a rectangle which is not a square.)

Paso 2

Usando SCOTCH TAPE, junte los extremos (los bordes más cortos) de una tira de papel para formar una banda circular.

Step 2

Using SCOTCH TAPE, join the ends (the two shorter edges) of one strip of paper to form a circular band.

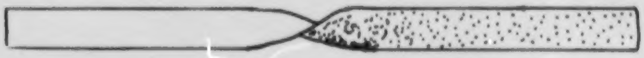


Paso 3

Déle media vuelta a la otra tira de papel.

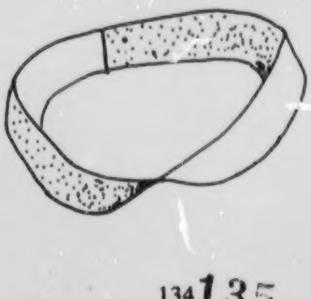
Step 3

Give the other strip of paper a half-twist.



Después usando SCOTCH TAPE, junte los extremos (los bordes más cortos) para forma una banda, la cual se llama Banda de MOBIUS.

Then, using SCOTCH TAPE, join the ends (the two shorter edges) to form a band, which is called a MOBIUS Strip.

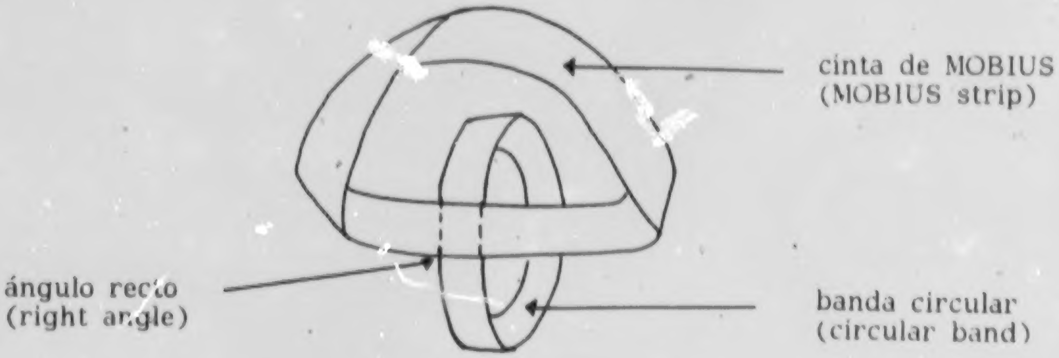


Paso 4

Pegue las dos bandas juntas de manera que el borde de la banda de MOBIUS y un borde de la banda circular formen un ángulo recto (o una esquina cuadrada.)

Step 4

Tape the two bands together at one place so that the edge of the MOBIUS Strip and an edge of the circular band form a right angle (or a square corner.)

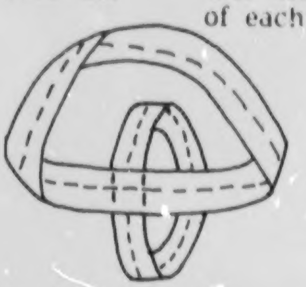

cinta de MOBIUS
(MOBIUS strip)
ángulo recto
(right angle)
banda circular
(circular band)

Paso 5

Corte a lo largo y a través del centro de cada banda.

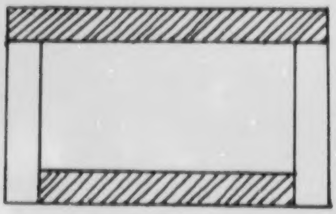
Step 5

Cut lengthwise through the center of each band.



La figura resultante será la representación de un rectángulo cuyos lados opuestos son del mismo color.

The resulting figure will be a representation of a rectangle whose opposite sides are the same color.



Señale los cuatro ángulos rectos de esta figura y dibuje una representación de un ángulo recto en la pizarra.	Point out the four right angles in this figure and sketch a representation of a right angle on the chalkboard.
Defina el rectángulo y el cuadrado, debujando varias representaciones de ellos en la pizarra.	Define rectangle and square, sketching several representations of them on the chalkboard.
Explíqueles el significado del perímetro.	Explain what is meant by perimeter.
Usando varios ejemplos, demuéstreles cómo calcular el perímetro de un rectángulo, de un cuadrado, y de otros polígonos.	Using several examples, demonstrate how to find the perimeter of a rectangle, a square, and other polygons.

AREA OF RECTANGLES

LESSON 5B-6

Student Booklet, p. 38

CONCEPT

Area of rectangles

VOCABULARY

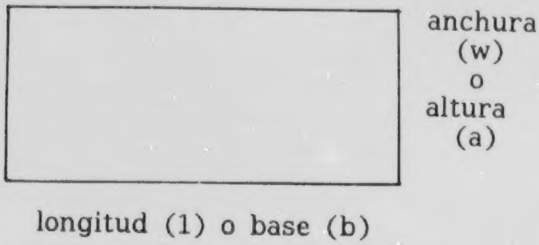
altura	height
anchura	width
área	area
base	base
cuadrado	square
lado	side
longitud	length
región básica	unit region
rectángulo	rectangle
unidad cuadrada	square unit

RESOURCES

1. One centimeter graph paper
2. Scissors
3. Worksheets M5-3 and M5-4

PROCEDURE

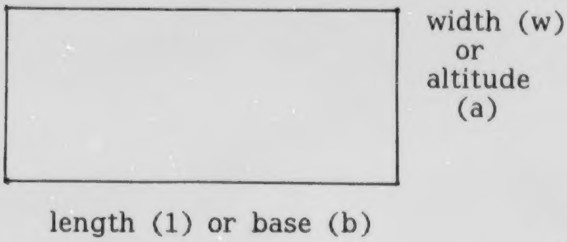
Explíqueles el significado del área usando el mismo procedimiento expleado en el libro del estudiante, expresando el área en regiones básicas. Muestre a los estudiantes lo que quiere decir longitud (1) y anchura (w) de un rectángulo o la base (b) y altura (a).



Haga que cada estudiante dibuje representaciones de rectángulos de las siguientes dimensiones en una hoja de papel para gráficas. (El estudiante deberá usar las mismas unidades de longitud que estén en el papel para gráficas).

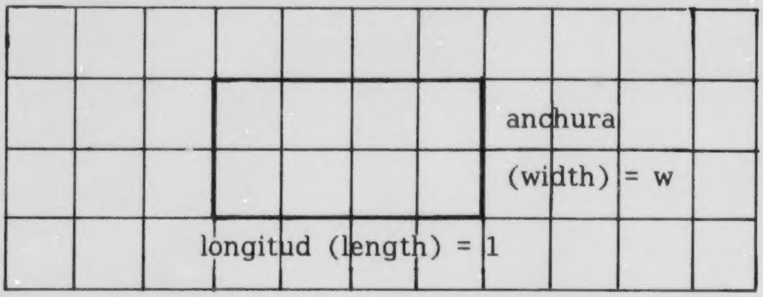
1. 8 por 1
2. 4 por 2
3. 3 por 3
4. 10 por 5

Explain the meaning of area in terms of unit regions, as it is presented in the student booklet. Show the students what is meant by the length (1) and width (w) of a rectangle, or the base (b) and altitude (a).



Have each student draw representations of rectangles of the following dimensions on a sheet of graph paper. (The student should use the same units of length as those on the graph paper.)

1. 8 by 1
2. 4 by 2
3. 3 by 3
4. 10 by 5



Haga que los estudiantes calculen el área de cada rectángulo contando los cuadrados. Después, pregúnteles si ellos pueden dar una regla (fórmula) para calcular el área de un rectángulo.

Have the students calculate the area of each rectangle by counting the squares. Then ask them if they can give a rule (formula) for computing the area of a rectangle.

Escriba la fórmula expresándola en dos formas diferentes:

A = 1 x w
A = b x a

Explíqueles como usar la fórmula para calcular el área de uno de los rectángulos que ellos hayan dibujado.

Write the formula, giving it in two different forms:

A = 1 x w
B = b x a

Show how to use the formula to complete the area of one of the rectangles they have drawn.

Ejemplo - Example

A = 1w
A = 4 x 2
A = 8 unidades cuadradas
(8 square units)

Pida que los estudiantes completen la Hoja de Trabajo M5-3 (área de rectángulos) y la Hoja de trabajo M5-4 (TANGRAMS).

Have the students complete Worksheet M5-3 (area of rectangles) and Worksheet M5-4 (TANGRAMS).

AREA OF TRIANGLES
AREA OF PARALLELOGRAMS

LESSONS 5B-7, 5B8

Student Booklet p. 49

CONCEPTS

Area of triangles
Area of parallelograms

VOCABULARY

altura	altitude (height)
ángulo recto	right angle
área	area
base	base
paralelogramo	parallelogram
rectas paralelas	parallel lines
triángulo	triangle
vértice	vertex

RESOURCES

1. Worksheet M5-5
2. Worksheet M5-6

PROCEDURE

Explíqueles lo que es un paralelogramo y dibuje varias representaciones diferentes de paralelogramos en la pizarra. Rotule la base y la altura de cada una de esas figuras. Ponga énfasis en el concepto de altura, debida a que muchos estudiantes tienen dificultad en comprenderlo.

Haga que los estudiantes completen la Hoja de trabajo M5-5. Esta los ayudará a familiarizarse con el concepto de un paralelogramo y también descubrir la fórmula A = ba. Después de que los estudiantes hayan completado la hoja de trabajo, repase los conceptos importantes. Revise las respuestas y cerciórese que los estudiantes han escrito la fórmula correcta del área.

Dibuje varias representaciones de triángulos en la pizarra y muestre a la clase lo que significa la base y la altura.

Pida que los estudiantes completen la Hoja de Trabajo M5-6 para que se familiaricen con el concepto del área de un triángulo. Use el mismo procedimiento empleado en la Hoja de Trabajo M5-5.

Explain what is meant by a parallelogram and draw several different representations of parallelograms on the chalkboard. Label the base and the altitude of each of these figures. Emphasize the concept of altitude, since many students have difficulty understanding it.

Have the students complete Worksheet M5-5. This should help them become familiar with the concept of area of parallelogram and discover the formula A = ba. After the students have completed the worksheet, discuss it with the class. Check the answers and make certain the students have written the correct formula for area.

Sketch several representations of triangles on the chalkboard and show the class what is meant by the base and altitude.

Have the students complete Worksheet M5-6 in order to become familiar with the concept of area of a triangle. Use the same procedure as for Worksheet M5-5.

STATED PROBLEMS

LESSON 5B-9

Student Booklet p. 63

CONCEPT

Solving stated problems involving area and perimeter of polygons

VOCABULARY

área	area
cuadrado	square
paralelogramo	parallelogram
perímetro	perimeter
rectángulo	rectangle
triángulo	triangle

RESOURCES

None

PROCEDURE

Explíqueles el siguiente ejemplo de un problema descriptivo, en que se pide el cálculo del área y del perímetro de un polígono. Dibuje el polígono que se pide y destaque que los estudiantes deberán dibujar los polígonos al resolver los problemas del Ejercicio 5B-9.

Discuss the following example of a stated problem which requires finding the area and the perimeter of a polygon. Draw a sketch of the required polygon and emphasize that it is important to do this when solving the problems of Exercise 5B-9.

Ejemplo

Elain está decorando la tabilla (cartel) de su salón de clase para las Navidades. La tablilla (cartel) tiene 6 pies de longitud y 3 pies de anchura. Ella desea poner un borde de cinta verde y un fondo de papel rojo.

a. ¿Cuántos pies de cinta (listón) verde necesitará Elain?

Example

Elain is decorating the bulletin board of her classroom for Christmas. The board is 6 feet long and 3 feet wide. She wants a border of green ribbon and a background of red paper.

a. How many feet of green ribbon will Elain need?

b. ¿Cuántos pies cuadrados de papel rojo necesitará ella para el fondo?

b. How many square feet of red paper will she need for the background?

CLAVE/ANSWER KEY

MANUAL DEL ESTUDIANTE
STUDENT BOOKLET

NIVEL 5A/LEVEL 5A

CLAVE/ANSWER KEY

MANUAL DEL ESTUDIANTE/STUDENT BOOKLET

NIVEL 5A / LEVEL 5A

EJERCICIO 5A-1/EXERCISE 5A-1, pages 4-5

I.

1. unión - union
2. intersección - intersection
3. unión - union
4. intersección - intersection
5. unión - union

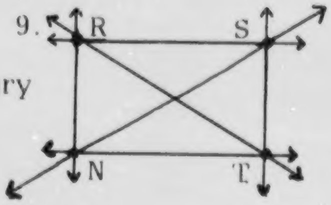
II.

6. (a, b, c, d, x, y, z)
7. (3, 4)
8. (3, 4, 9, b, c, r, x)
9. ϕ
10. (n, t, x, u, c)

EJERCICIO 5A-2/EXERCISE 5A-2, pages 14-15

1. a
2. c
3. respuestas diversas - answers vary
4. b
5. b
6. a
7. b c
8. a. $\overleftrightarrow{RT}$
   b. $\overline{ON}$
   c. P

9.



10. c

EJERCICIO 5A-3/EXERCISE 5A-3, pages 22-23

1. a. 6
   b. 8
   c. 3
   d. 1
   e. 5

2. a. $\overline{AB}$
   b. $\overrightarrow{RT}$
   c. $\overrightarrow{RN}$
   d. $\overline{SZ}$

3. a. recta - line
   b. segmento de recta - line segment
   c. rayo - ray
   d. recta - line
   e. semirrecta abierta - open half-line
   f. segmento de recta - line segment

4. a. $\overleftrightarrow{RS}$
   b. $\overset{\circ\!\!\longrightarrow}{NT}$
   c. P

EJERCICIO 5A-4/EXERCISE 5A-4, pages 30-31

1. a. recta - line
   b. espacio - space
   c. plano - plane
   d. plano - plane
   e. espacio - space
   f. espacio - space
   g. espacio - space
   h. recta - line
   i. plano - plane

2. Las respuestas serán diversas.
   Answers will vary.
   a. hilo - string
   b. el borde de un escritorio - edge of desk
   c. la cuerda para colgar la ropa - clothes line
   d. alambre - wire
   e. la orilla de un libro - edge of a book

3. Las respuestas serán diversas
   Answers will vary.
   a. papel - paper
   b. la cubierta de un escritorio - desk top
   c. el cielo - ceiling
   d. las paredes - walls
   e. el piso - floor

4. Las respuestas serán diversas
   Answers will vary.
   a. casa - house
   b. lata (envase) - can
   c. cubo de hielo - ice cube
   d. caja - box
   e. botella - bottle

EJERCICIO 5A-5/EXERCISE 5A-5, pages 34-35

a. $\overleftrightarrow{RN}$
b. $\overleftrightarrow{ST}$
c. $\overleftrightarrow{RX}$
d. $\overleftrightarrow{YX}$
e. $\overleftrightarrow{AB}$
f. $\overleftrightarrow{LX}$

EJERCICIO 5A-6/EXERCISE 5A-6, pages 38-39

1. a. $\angle RTO$ o (or) $\angle LTR$
   b. $\angle SBF$ o (or) $\angle FBS$
   c. $\angle GEA$ o (or) $\angle AEG$
   d. $\angle ABC$ o (or) $\angle CBA$

2. a. $\overrightarrow{MJ}$, $\overrightarrow{MO}$, $\overrightarrow{ME}$
   b. $\angle$ JMO, / OME, $\angle$JME
   (cualquiera de los dos)
   (any two)
   c. M

3. a. $\overleftrightarrow{RX}$ o (or) $\overleftrightarrow{XR}$
   b. LRTS o (or) LSTR
   c. $\angle$ STX o (or) $\angle$XTS
   d. $\angle$ RTS o (or) $\angle$STR
   e. $\angle$ UTX o (or) $\angle$XTU
   f. $\angle$ RTU o (or) $\angle$UTR

EJERICICO 5A-7/EXERCISE 5A-7, pages 44-45

1. a. O
   b. R
   c. B
   d. C

2. a. $\overleftrightarrow{EB}$ o (or) $\overleftrightarrow{BE}$
   b. $\overline{BC}$ o (or) $\overline{CB}$
   c. $\overline{AB}$ o (or) $\overline{BA}$
   d. $\overline{AE}$ o (or) $\overline{EA}$
   e. A
   f. A

REPASO 5A/REVIEW 5A, pages 48-53

1. a. $\overleftrightarrow{AB}$
   b. R
   c. $\overline{NO}$
   d. $\overrightarrow{MR}$
   e. $\overrightarrow{ST}$
   f. R
   d. F
   e. $\overrightarrow{FC}$
   f. B
   g. $\emptyset$
   h. $\emptyset$

2. a. $\angle$ ABC o (or) $\angle$ CBA
   b. $\angle$ DEF o (or) $\angle$ FED
   c. $\angle$ GHJ o (or) $\angle$ JHG
   d. $\angle$ LKM o (or) $\angle$ MKL
   e. $\angle$ NOP o (or) $\angle$ PON

3. a. $\overleftrightarrow{ON}$ o (or) $\overleftrightarrow{NO}$
   b. $\angle$ OTP o (or) $\angle$ PTO
   c. $\overleftrightarrow{ON}$ o (or) $\overleftrightarrow{NO}$
   d. $\overline{PX}$ o (or) $\overline{XP}$

4. a. $\overleftrightarrow{AC}$
   b. $\overline{BC}$ o (or) $\overline{CB}$
   c. $\overleftrightarrow{BD}$ o (or) $\overleftrightarrow{BC}$

5. $\overleftrightarrow{GD}$ o (or) $\overleftrightarrow{DG}$

6. No se cortan; la intersección es $\emptyset$ None; the intersection is $\emptyset$

7. $\overleftrightarrow{RQ}$ y $\overleftrightarrow{ZX}$, rectas contenidas en el plano M, se cortan (se intersectan) en el punto P.

   $\overleftrightarrow{RQ}$ and $\overleftrightarrow{ZX}$, lines which are contained in plane M, intersect in point P.

CLAVE/ANSWER KEY

MANUAL DEL ESTUDIANTE
STUDENT BOOKLET

NIVEL 5B/LEVEL 5B

CLAVE/ANSWER KEY

MANUAL DEL ESTUDIANTE/STUDENT BOOKLET

NIVEL 5B / LEVEL 5B

EJERCICIO 5B-1/EXERCISE 5B-1, pages 4-5

1. 126 mm.
2. 45 pulg. - 45 in.
3. 17 pulg. - 17 in.
4. 107 cm.
5. 89 mi.
6. 19 mi.
7. 45 pies - 45 ft.
8. 11 mm.
9. 8 pulg. - 8 in.
10. 12 yd.

EJERCICIO 5B-2/EXERCISE 5B-2, pages 14-15

1. 7/8
2. 1-1/2
3. 2
4. 1
5. 1-3/4
6. 2-5/10 o (or) 2-1/2
7. 1-1/4
8. 2-1/8
9. 3-5/10 o (or) 3-1/2
10. 1-3/4
11. 1-1/2
12. 2
13. 2
14. 3
15. 5
16. 2
17. 2-3/4
18. 1-5/8
19. 4-2/16
20. 5
21. 40
22. 18
23. 7

EJERCICIO 5B-3/EXERCISE 5B-3, pages 20-21

1. 1-1/2
2. 2-1/4
3. a. 1
   b. 1-1/2
   c. 1-1/2
   d. 1-3/8
4. 2-1/4
5. 2-1/2
6. 2-7/8
7. 4
8. 54
9. 5
10. 7

EJERCICIO 5B-4/EXERCISE 5B-4, pages 26-27

1. 27
2. 20
3. 32
4. 50
5. 40
6. 32
7. 18
8. 18
9. 66
10. 38
11. 24
12. 32

EJERCICIO 5B-5/EXERCISE 5B-5, pages 36-37

1. 36
2. 28
3. 24
4. 32
5. 32
6. 40
7. 56
8. 40
9. 50
10. 62
11. 44
12. 30

EJERCICIO 5B-6/EXERCISE 5B-6, pages 44-45

1. 80
2. 85-9/16
3. 91
4. 71-1/4
5. 210
6. 120
7. 169
8. 100
9. 85
10. 139-1/21
11. 114
12. 10-1/2

EJERCICIO 5B-7/EXERCISE 5B-7, pages 50-51

1. 45
2. 50
3. 6
4. 27
5. 24
6. 27-1/2
7. 97-1/2
8. 77-1/2
9. 39-9/10
10. 28

EJERCICIO 5B-8/EXERCISE 5B-8, pages 58-59

1. 48
2. 6
3. 36
4. 20
5. 21
6. 70
7. 24
8. 20
9. 84
10. 38-1/2
11. 75-25/56
12. 82

EJERCICIO 5B-9/EXERCISE 5B-9, pages 62-63

1. a. 12 pies cuad. - 12 sq. ft.
   b. 36 pies cuad. - 36 sq. ft.
   c. 1 cuarto - 1 quart
2. a. 16 pies - 16 ft.
   b. 15 pies cuad. - 15 sq. ft.
   c. 2
3. 100 pulg. - 100 in.
4. a. 360 pies - 360 ft.
   b. 8,100 pies - 8,100 ft.
5. 12 cm. cuad. - 12 sq. cm.
6. 380 pies - 380 ft.
7. 12 yd cuad. - 12 sq. yd.

REPASO 5B/REVIEW 5B, pages 68-71

1. $\overrightarrow{RN}$, $\overrightarrow{RP}$, $\overrightarrow{RT}$ (otras respuestas posibles) $\overrightarrow{RN}$, $\overrightarrow{RP}$, $\overrightarrow{RT}$ (other possible answers)

2. $\overleftrightarrow{NT}$, $\overleftrightarrow{SP}$ (otras respuestas posibles) $\overleftrightarrow{NT}$, $\overleftrightarrow{SP}$ (other possible answers)

3. $\overline{NR}$, $\overline{PR}$, $\overline{TR}$, $\overline{SR}$ (otras respuestas posibles) $\overline{NR}$, $\overline{PR}$, $\overline{TR}$, $\overline{SR}$ (other possible answers)

4. S, R, T, N, P

5. a. $\overleftrightarrow{NT}$
   b. $\angle PRT$
   c. $\angle NRS$
   d. $\overline{SP}$
   e. R
   f. R

6. 29 cm.
7. 24 pies - 24 ft.
8. 16 yd.
9. 21 mm. cuad. - 21 sq. mm.
10. 12-1/4 yd. cuad. - 12-1/4 sq. yd.
11. 27-1/7 mi. cuad. - 17-1/7 sq. mi.
12. 18 pulg. cuad. - 18 sq. in.
13. 4
14 2-1/4
15. 3
16. 31
17. 2-1/2

CLAVE/ANSWER KEY

MODELOS Y ACTIVIDADES
PATTERNS AND ACTIVITIES

NIVEL 5/LEVEL 5

CLAVE/ANSWER KEY

MODELOS Y ACTIVIDADES/PATTERNS AND ACTIVITIES

NIVEL 5 / LEVEL 5

M5-3

Figura 1 (Figure 1)

1. 5
2. 2
3. 5 x 2 = 10

Figura 2 (Figure 2)

1. cuadrado - square
2. 3
3. 3 x 3 = 9

Figura 3 (Figure 3)

1. 4
2. 1
3. 4 x 1 = 4

M5-4

See next page.

M5-5

1. 6, 4, 24, 6, 4, 24
2. 4, 4, 16, 4, 4, 16
3. 9, 2, 18, 9, 2, 18
4. 7, 4, 28, 7, 4, 28
   A = ba
   A = ba
5. 20 pies cuad. - 20 sq. ft.
6. 21 pies cuad. - 21 sq. ft.

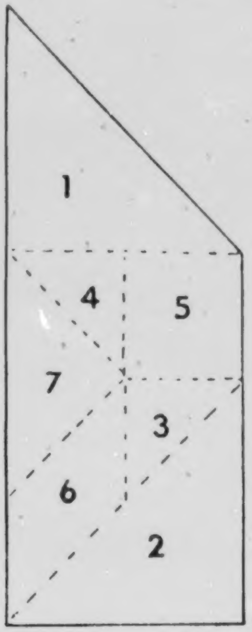
M5-6

1. 8, 4, 32, 8, 4, 16
2. 5, 5, 25, 5, 5, 12 1/2
3. 8, 6, 48, 8, 6, 24

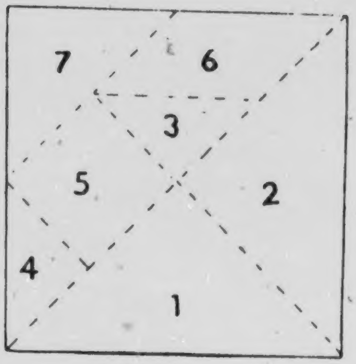
$A = 1/2\ ba$

4. 250 pulg. cuad. - 250 sq. in.
5. 84 pulg. cuad. - 84 sq. in.
6. 30 pulg. cuad. - 30 sq. in.

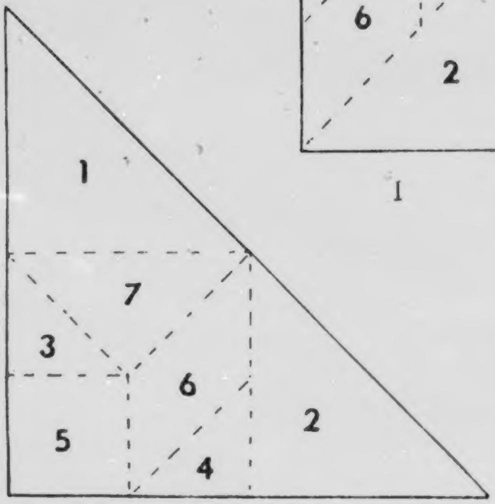
M5-4



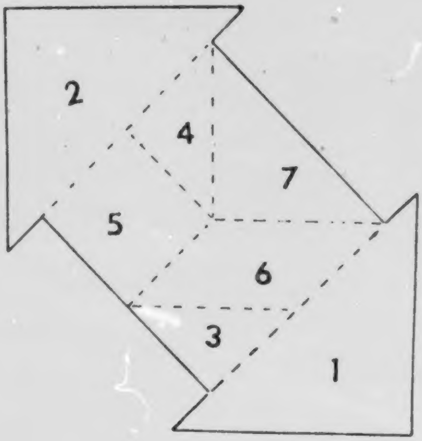
I



II



III



IV

Todas las figuras tienen la misma área.
All the figures have the same area.

CLAVE/ANSWER KEY

EXÁMENES/TESTS

NIVEL 5/LEVEL 5

CLAVE/ANSWER KEY

EXAMEN 1 / TEST 1

NIVEL 5 / LEVEL 5

1. a
2. b
3. d
4. c
5. $\angle XYZ$
6. $\angle ZYX$
7. b
8. c
9. c
10. b
11. c
12. b
13. 1-1/4 pulg. - 1-1/4 in.
14. 2 pulg. - 2 in.
15. 5 cm.
16. 39 mm.
17. 2 pulg. - 2 in.
18. 23 mm.
19. 28 pulg. - 28 in.
20. 52 yd.
21. 15 cm.
22. 7 pulg. cuad. - 7 sq. in.
23. 14 cm. cuad. - 14 sq. cm.
24. 81 yd. cuad. - 81 sq. yd.
25. 72 pies cuad. - 72 sq. ft.

CLAVE/ANSWER KEY

EXAMEN 2 / TEST 2

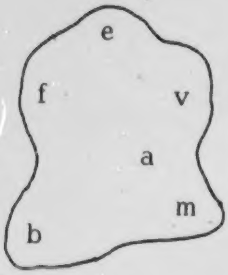
NIVEL 5 / LEVEL 5

1. b
2. c
3. d
4. a
5. ∠ ABC
6. ∠ CBA
7. b
8. a
9. b
10. c
11. a
12. c
13. 1-6/8 in.
14. 7 cm.
15. 3 pulg. - 3 in.
16. 34 mm.
17. 2-1/2 pulg. - 2-1/2 in.
18. 32 cm.
19. 17 pulg. - 17 in.
20. 36 mm.
21. 40 pulg. - 40 in.
22. 36 cm. cuad. - 36 sq. cm.
23. 255 pulg. cuad - 255 sq. in.
24. 12-3/8 cm. cuad. - 12-3/8 sq. cm.
25. 400 mm. cuad. - 400 sq. mm.

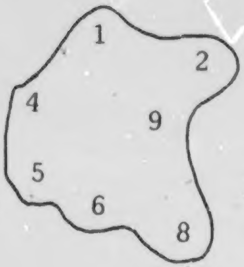
MODELOS Y ACTIVIDADES
PATTERNS AND ACTIVITIES

NIVEL 5/LEVEL 5

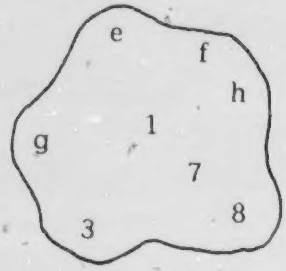
M5 - 1



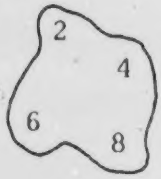
(a, b, e, f, m, v)



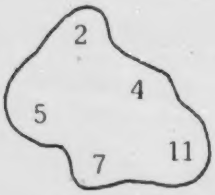
(1, 2, 4, 5, 6, 8, 9)



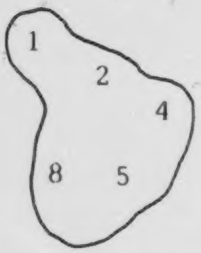
(e, f, g, h, 1, 2, 3, 7, 8)



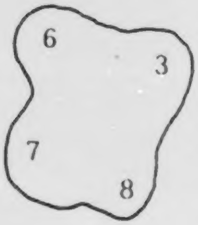
(2, 4, 6, 8)



(2, 4, 5, 7, 11)

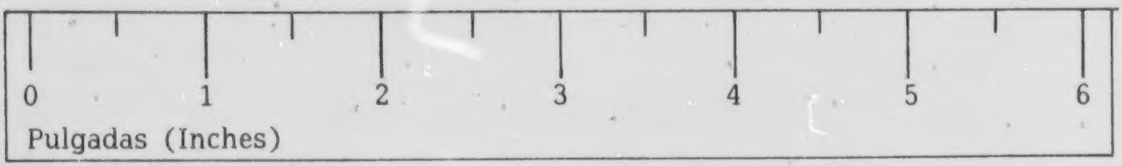


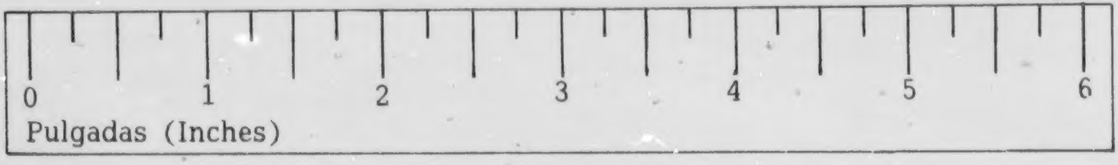
(1, 2, 4, 6, 8)

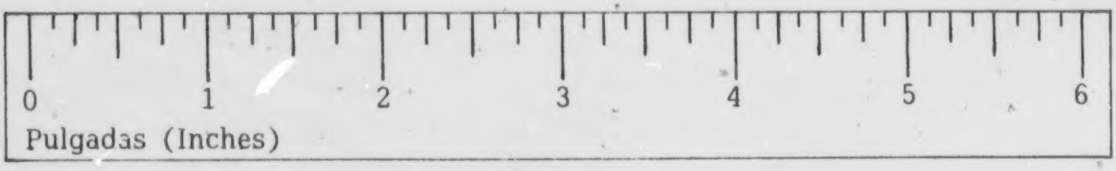


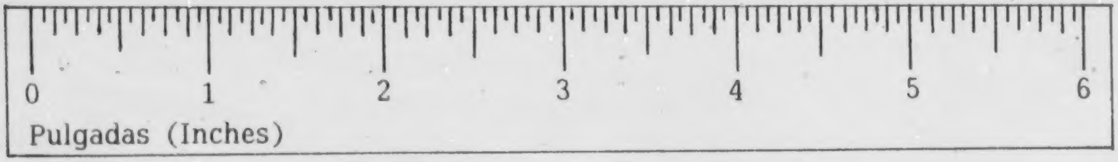
(3, 6, 7, 8)

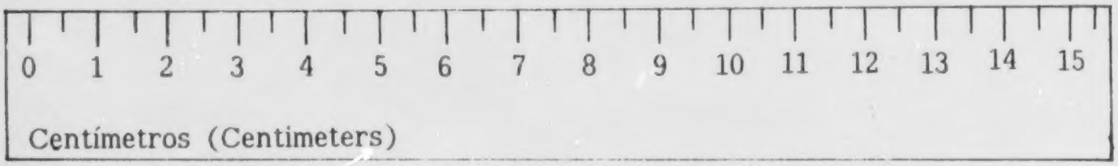
M5 - 2


Pulgadas (Inches)


Pulgadas (Inches)

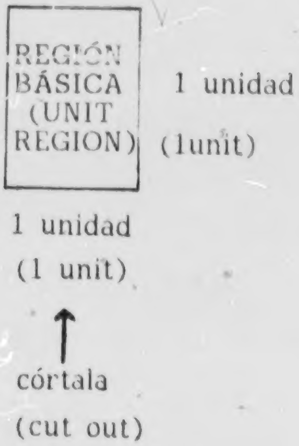

Pulgadas (Inches)


Pulgadas (Inches)


Centímetros (Centimeters)

NOMBRE-NAME______________________ HOJA DE TRABAJO - WORKSHEET

ÁREA DE UN RECTÁNGULO AREA OF A RECTANGLE


REGIÓN BÁSICA (UNIT REGION)
1 unidad
(1unit)
1 unidad
(1 unit)
córtala
(cut out)

Instrucciones: Con las tijeras, corta la región básica. Calcula el área de cada rectángulo, determinando cuántas unidades básicas caben en cada región interior. Después escribe las respuestas correctas en los espacios en blanco.

Directions: Using scissors, cut out the unit region. Determine the area of each rectangle by finding out how many unit regions will fit into each interior region. Then write the correct answers in the blanks.

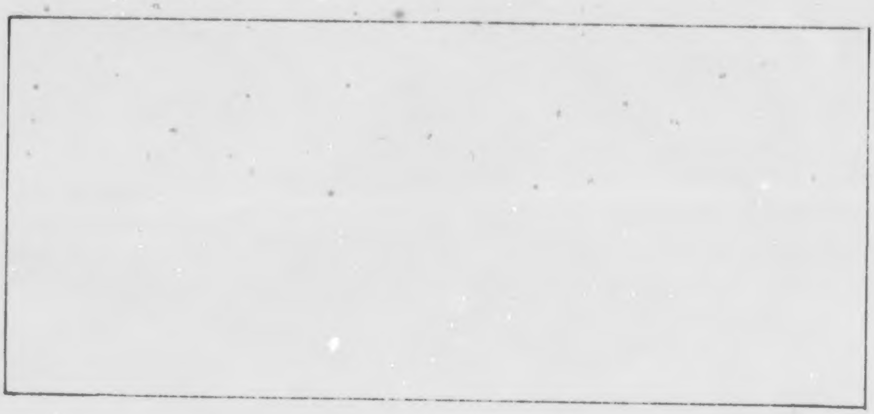


Figura 1 - Figure 1

Figura 1	Figure 1
1. La cantidad de unidades en la base es ____________.	1. The number of units in the base is ____________.
2. La cantidad de unidades en la altura es ____________.	2. The number of units in the altitude is ____________.

3. Área (area) = ________ x ________ = ________ unidades cuadradas (square units)

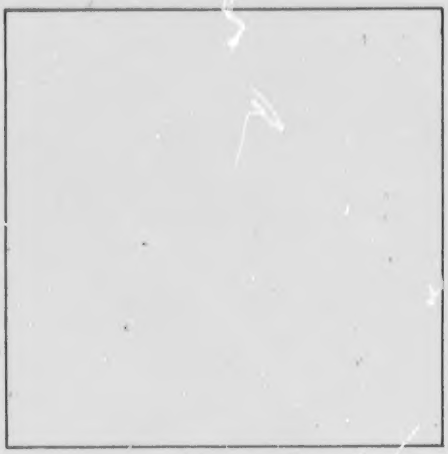


Figura 2 - Figure 2

Figura 2	Figure 2
1. Figura 2 es un tipo especial de rectángulo que se llama ____________.	1. Figure 2 is a special type of rectangle called a ____________.
2. La longitud de un lado mide ____________ unidades.	2. The length of one side is ____________ units.

3. A = ________ x ________ = ________ unidades cuadradas (square units)

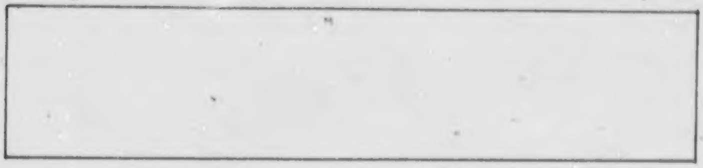


Figura 3 - Figure 3

Figura 3	Figure 3
1. La cantidad de unidades en la base es ____________________.	1. The number of units in the base is ____________________.
2. La cantidad de unidades en la altura es __________________:	2. The number of units in the altitude is _________________.

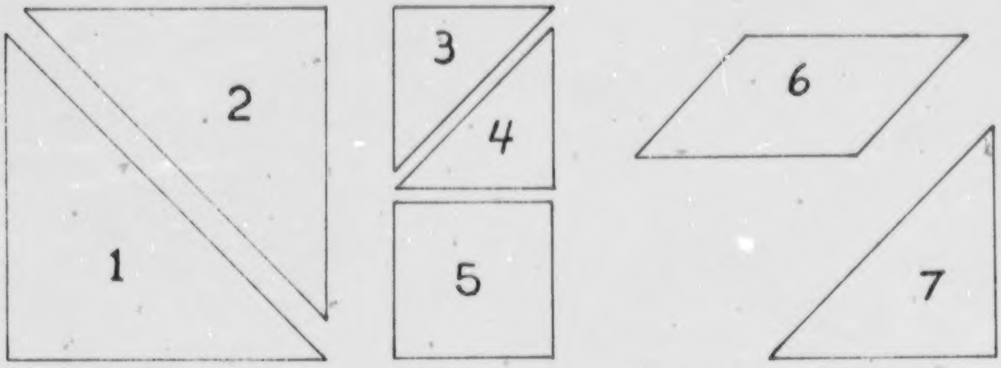
3. A = ____________x____________=_________________ unidades cuadradas (square units)

NOMBRE-NAME______________________________HOJA DE TRABAJO - WORKSHEET

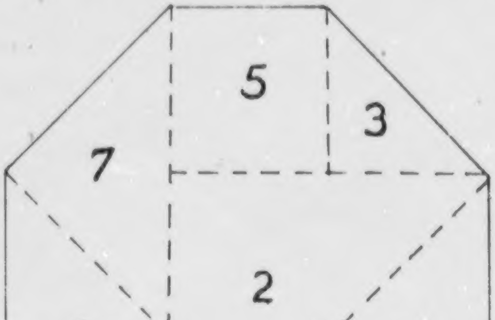
ROMPECABEZAS PARA EL ÁREA

AREA PUZZLE

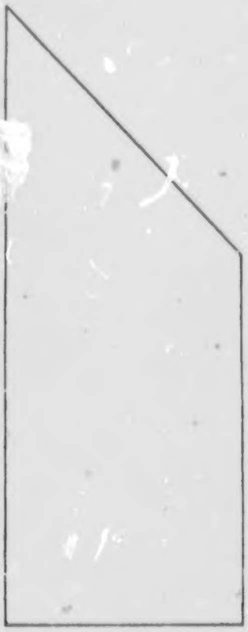
Estos siete trozos son las partes de un rompecabezas llamado tangram. Traza los trozos y córtalos.
These seven pieces are the parts of a tangram puzzle. Trace the pieces and cut them out.



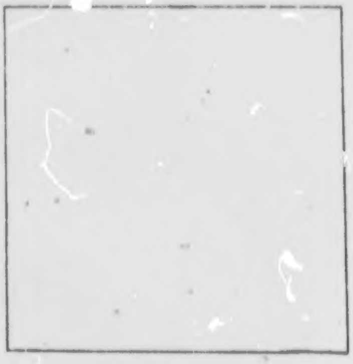
Este hexágono se puede cubrir usando todos los trozos del rompecabezas.
This hexagon can be covered by using all of the pieces of the puzzle.



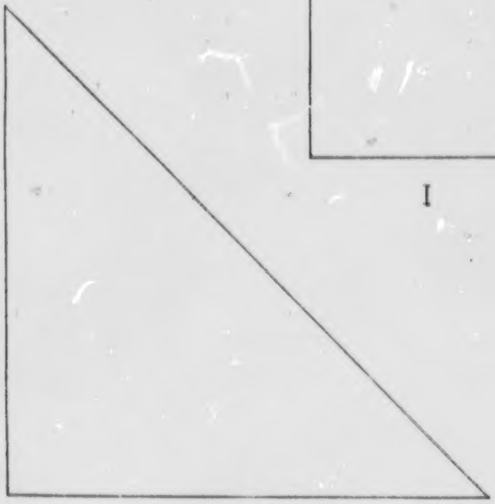
Usando los trozos del rompecabezas tangram, cubre las siguientes figuras geométicas.
¿Cuáles de las figuras tienen la misma área?
Using the pieces of the tangram puzzle, cover the following geometric figures.
Which of the figures have the same area?



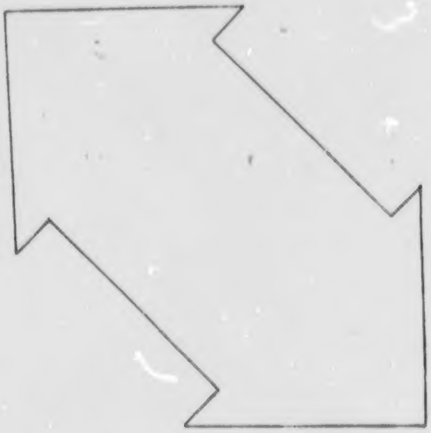
I



II



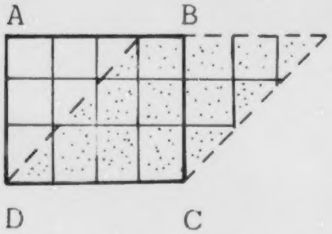
III



IV

NOMBRE-NAME______________________HOJA DE TRABAJO - WORKSHEET

ÁREA DE LOS PARALELOGRAMOS - AREA OF PARALLELOGRAMS



Ejemplo - Example

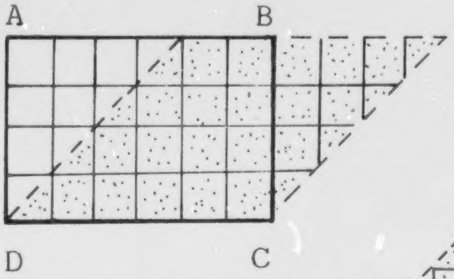


FIG. 1

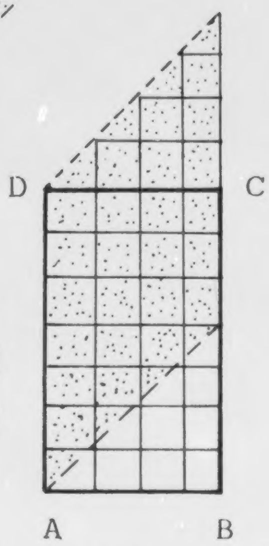


FIG. 4

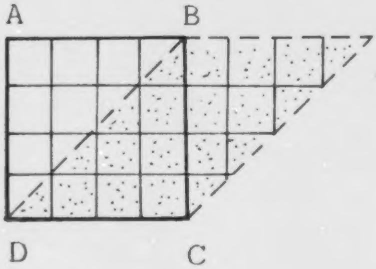


FIG. 2

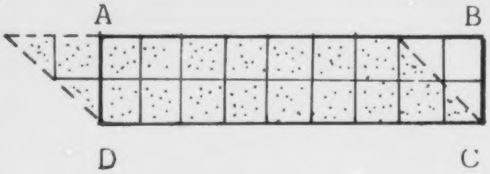


FIG. 3

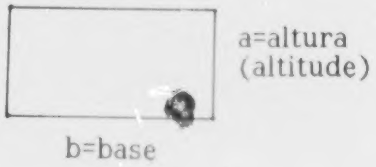
La parte sombreada de cada figura representa la región interior de un paralelogramo ▱ , mientras A B C D representa un rectángulo ▭ . Estudia el ejemplo y después completa la tabla, expresando las medidas en las unidades básicas usadas en las figuras.

The shaded part of each figure represents the interior region of a parallelogram ▱ , while A B C D represents a rectangle ▭. Study the sample and then complete the chart, expressing the measures in the basic units shown in the figures.

FIGURA (FIGURE)	▭ (RECTÁNGULO) A B C (RECTANGLE)			▱ (PARALELOGRAMO) (PARALLELOGRAM)		
	Longitud de la base	Longitud de la altura	ÁREA (o usa la fórmula A = ba o cuenta cuadrados.)	Longitud de la base	Longitud de la altura	ÁREA (Cuenta los cuadrados)
	Length of the base	Length of the altitude	AREA (Use the formula A = ba or count the squares.)	Length of the base	Length of the altitude	AREA (Count the squares.)
Ejemplo (Example)	4	3	12	4	3	12
1.						
2.						
3.						
4.						

Para calcular el área de un rectángulo, multiplica la longitud de la base por la longitud de la altura.

To find the area of a rectangle, multiply the length of the base by the length of the altitude.



La fórmula para calcular el área de un rectángulo es:

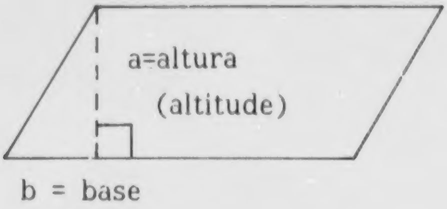
The formula for the area of a rectangle is:

A = ______________________

A = ____________________________.

Para calcular en área de un paralelogramo, multiplica la longitud de la base por la longitud de la altura.

To find the area of a parallelogram, multiply the length of the base by the length of the altitude.


a=altura
(altitude)
b = base

La fórmula para calcular el área de un paralelogramo es:

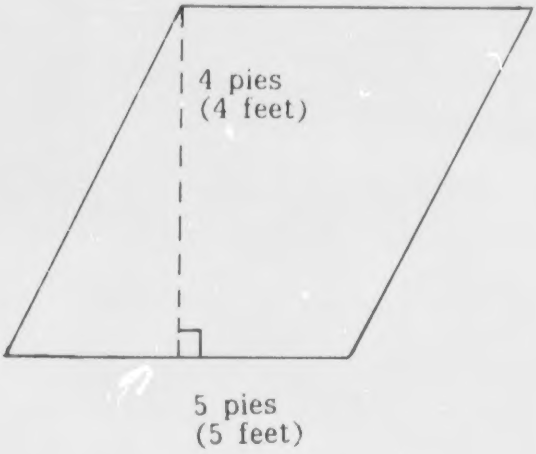
A = ______________________

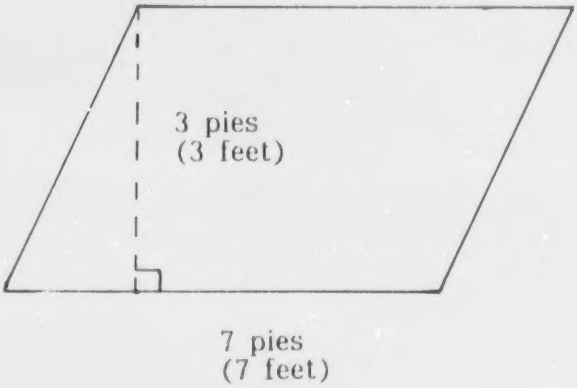
The formula for the area of a parallelogram is:

A = ____________________________

Calcula el área de cada paralelogramo. Usa la fórmula y presenta todo tu trabajo.

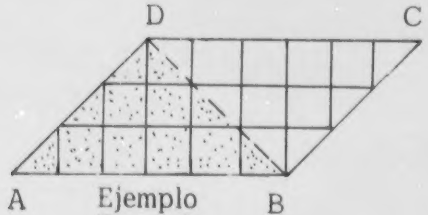
Find the area of each parallelogram. Use the formula and show all work.


4 pies
(4 feet)
5 pies
(5 feet)


3 pies
(3 feet)
7 pies
(7 feet)

NOMBRE-NAME________________________ HOJA DE TRABAJO - WORKSHEET

ÁREA DE TRIÁNGULOS - AREA DE TRIANGLES



Ejemplo
Example

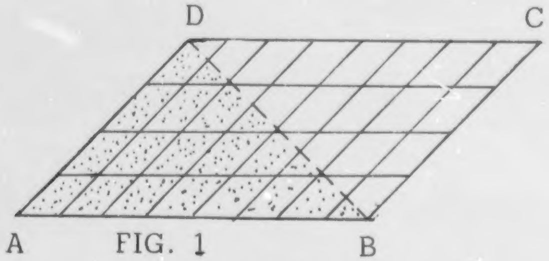


FIG. 1

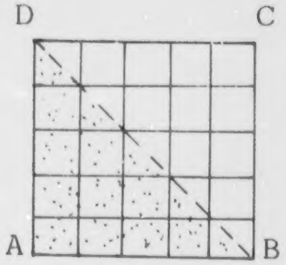


FIG. 2

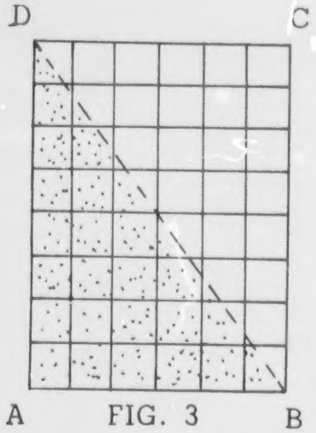


FIG. 3

En cada una de las figuras anteriores, A B C D forman un paralelogramo. (Recuerda, cuadros y rectángulos son paralelogramos.) En cada figura, A B C forman un triángulo y la parte sombreada es una región triangular.

Estudia los ejemplos y después completa la tabla, expresando las medidas en las unidades básicas usadas en las figuras.

In each of the preceding figures, A B C D form a parallelogram. (Remember, squares and rectangles are parallelograms.) In each figure A B C form a triangular region.

Study the example and then complete the chart, expressing the measures in the basic units shown in the figures.

▱ (PARALELOGRAMO) A B C D (PARALLELOGRAM)				△ (TRIÁNGULO) A B C (TRIANGLE)		
FIGURA (FIGURE)	Longitud de la base	Longitud de la altura	ÁREA (o usa la fórmula A = ba o cuenta los cuadrados)	Longitud de la base	Longitud de la altura	ÁREA (Cuenta los cuadrados)
	Length of the base	Length of the altitude	AREA (Use the formula A = ba or count the squares.)	Length of the base	Length of the altitude	AREA (Count the squares.)
Ejemplo (Example)	6	3	18	6	3	9
1						
2						
3						

Fíjate que el área de un triángulo es la mitad del área de un paralelogramo de la misma base y la misma altura.

La fórmula para calcular el área de un paralelogramo es A = ba. Por lo tanto, la fórmula para calcular el área de triángulo es:

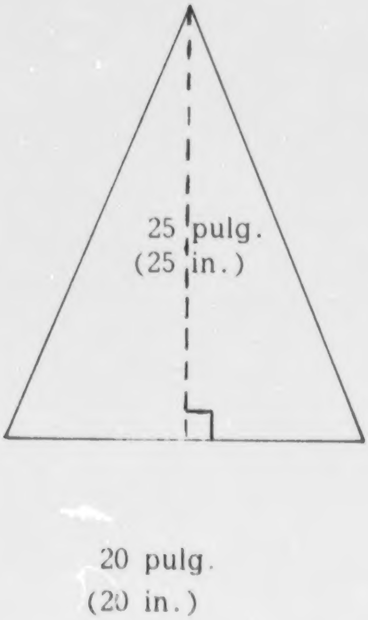
Notice that the area of a triangle is one half the area of a parallelogram which has the same base and altitude.

The formula to figure the area of the parallelogram is A = ba. Therefore the formula for the area of a triangle is:

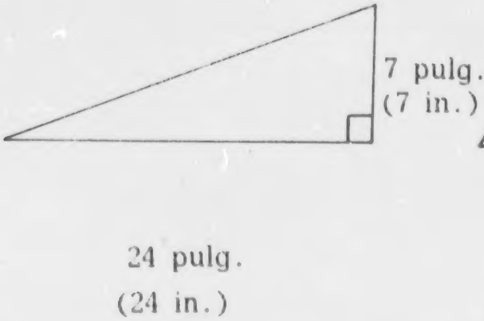
A = ______________________. A = ______________________.

Calcula el área de cada uno de los siguientes triángulos. Usa la fórmula y presenta todo tu trabajo.
Find the area of each of the following triangles. Use the formula and show all work.

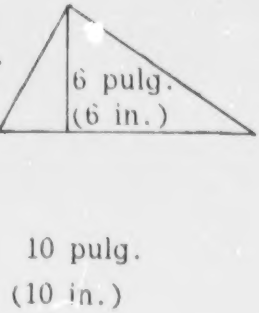
4.


25 pulg.
(25 in.)
20 pulg.
(20 in.)

5.


7 pulg.
(7 in.)
24 pulg.
(24 in.)

6.


6 pulg.
(6 in.)
10 pulg.
(10 in.)

EXÁMENES/TESTS

NIVEL 5/LEVEL 5

NIVEL 5 EXAMEN 1

Nombre	______________________	Fecha	____________________
Profesor	______________________	Período	____________________
Consejero	______________________	Calificación	____________________

¿Qué figura geométrica corresponde a cada expresión?

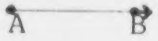
Escribe la letra que corresponde a la respuesta correcta.

_______1. Rayo A B

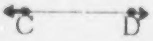
_______2. Recta C D

_______3. Segmento de recta CD

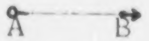
_______4. Semirrecta abierta A B



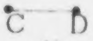
(a)



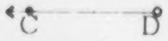
(b)



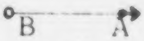
(c)



(d)

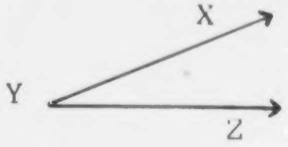


(e)



(f)

Designa (di el nombre de) este ángulo de dos maneras.



5. _______

6. _______

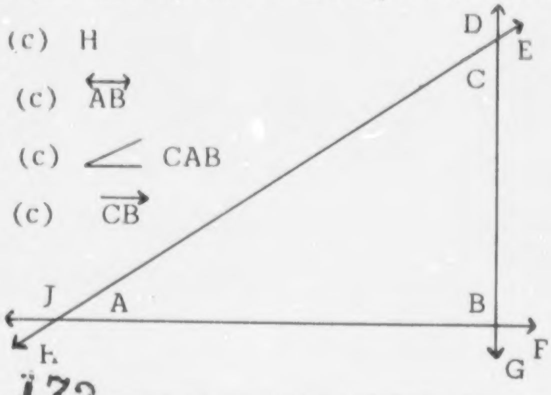
Usando el diagrama a la derecha haz las siguientes operaciones con conjuntos. Llena cada espacio en blanco con la letra que corresponda a la respuesta correcta.

_____7. $\overrightarrow{AH} \cap \overrightarrow{AE}$ (a) $\emptyset$ (b) A (c) H

_____8. $\overrightarrow{BJ} \cup \overrightarrow{AF}$ (a) $\overrightarrow{BJ}$ (b) $\overrightarrow{JB}$ (c) $\overleftrightarrow{AB}$

_____9. $\overrightarrow{AC} \cup \overrightarrow{AB}$ (a) A (b) $\overleftrightarrow{EH}$ (c) $\angle$ CAB

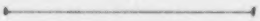
_____10. $\overrightarrow{BC} \cap \overrightarrow{CB}$ (a) $\overleftrightarrow{BC}$ (b) $\overline{BC}$ (c) $\overrightarrow{CB}$

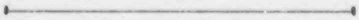


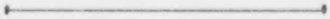
____11. $\overrightarrow{CE} \cap \overrightarrow{AB}$ (a) A (b) C (c) $\emptyset$

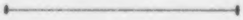
____12. $\overset{\circ}{\overrightarrow{AJ}} \cap \overrightarrow{AF}$ (a) A (b) $\emptyset$ (c) $\overline{AB}$

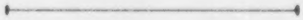
Mide cada segmento a la unidad más próxima (cercana) que se indica.

13.  $\doteq$ ____ (el 1/4 de pulgada más próximo)

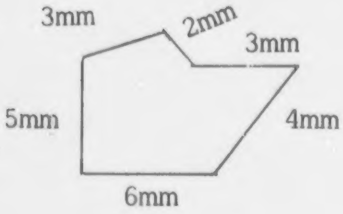
14.  $\doteq$ ____ (la pulgada más próxima)

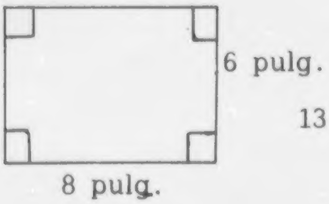
15.  $\doteq$ ____ (el centímetro más próximo)

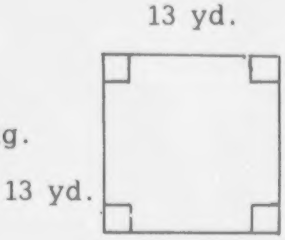
16.  = $\doteq$ ____ (el milímetro más próximo)

17.  = $\doteq$ ____ (la 1/2 pulgada más próxima)

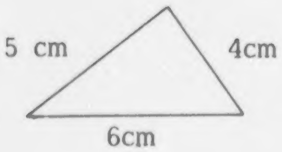
Calcula el perímetro de cada figura.


3mm
2mm
3mm
5mm
4mm
6mm


6 pulg.
8 pulg.

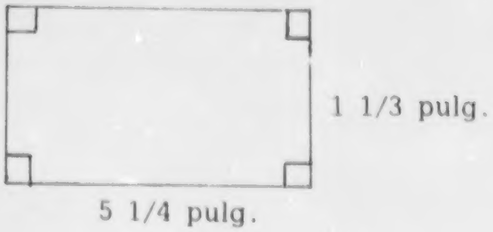


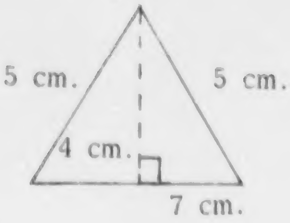
18. __________ 19. __________ 20. __________



21. ____________________

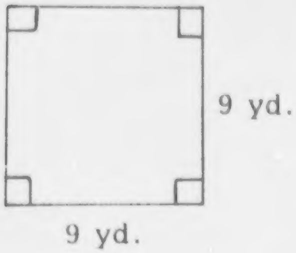
Calcula el área de cada figura. Usa la fórmula.

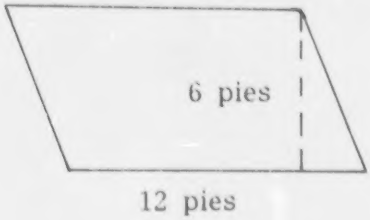

1 1/3 pulg.
5 1/4 pulg.


5 cm.
5 cm.
4 cm.
7 cm.

22. ______________________

23. ______________________




6 pies
12 pies

24. ______________________

25. ______________________

LEVEL 5/TEST 1

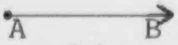
Name ______________________ Date ______________________

Teacher ______________________ Period ______________________

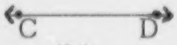
Advisor ______________________ Score ______________________

Match the following. Write the letter that corresponds to the correct answer.

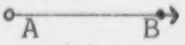
____1. Ray AB



(a)



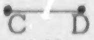
(b)



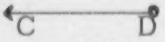
(c)

____2. Line CD

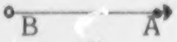
____3. Line segment CD



(d)



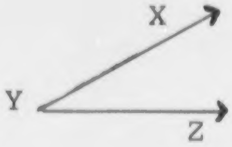
(e)



(f)

____4. Open half line AB

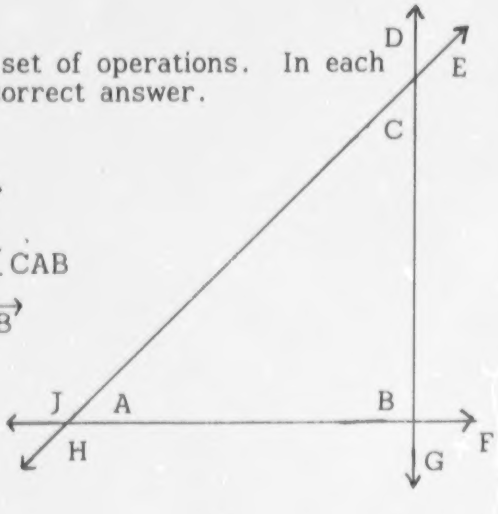
Give two names for the following angle.



5. ________

6. ________

Using the diagram shown, perform the following set of operations. In each blank, write the letter that corresponds to the correct answer.



____7. $\overrightarrow{AH} \cap \overrightarrow{AE}$ (a) $\emptyset$ (b) A (c) H

____8. $\overrightarrow{BJ} \cup \overrightarrow{AF}$ (a) $\overrightarrow{BJ}$ (b) $\overrightarrow{JB}$ (c) $\overleftrightarrow{AB}$

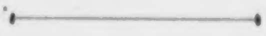
____9. $\overrightarrow{AC} \cup \overrightarrow{AB}$ (a) A (b) $\overleftrightarrow{EH}$ (c) $\angle CAB$

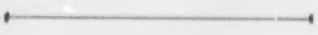
____10. $\overrightarrow{BC} \cap \overrightarrow{CB}$ (a) $\overleftrightarrow{BC}$ (b) $\overline{BC}$ (c) $\overline{CB}$

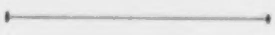
____11. $\overline{CE} \cap \overline{AB}$ (a) A (b) C (c) $\emptyset$

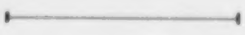
____12. $\overset{\circ}{\overrightarrow{AJ}} \cap \overrightarrow{AF}$ (a) A (b) $\emptyset$ (c) $\overline{AB}$

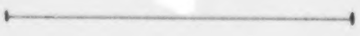
Measure each line segment to the nearest unit indicated.

13.  = ________ (nearest 1/4 inch)

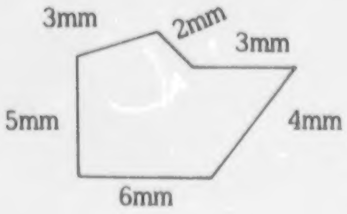
14.  = ________ (nearest inch)

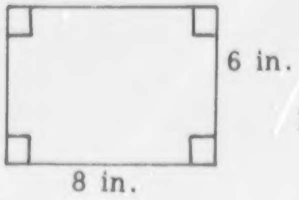
15.  = ________ (nearest centimeter)

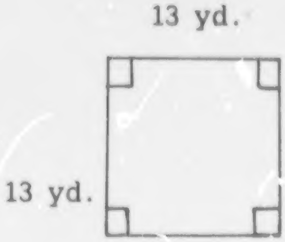
16.  = ________ (nearest millimeter)

17.  = ________ (nearest 1/2 inch)

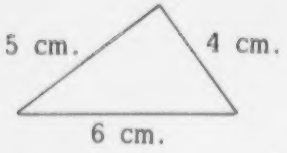
Find the perimeter of each figure.


3mm
2mm
3mm
5mm
4mm
6mm



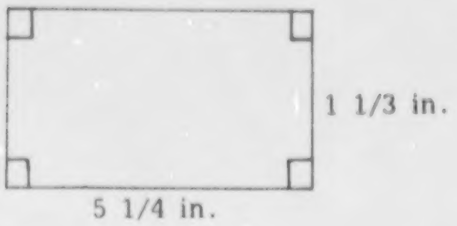


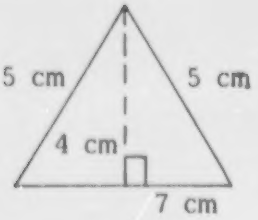
18. ____________ 19. ________________ 20. ________________



21. ________________________________

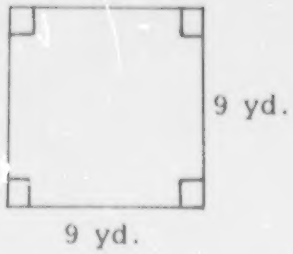
Find the area of each figure. Use the formula.

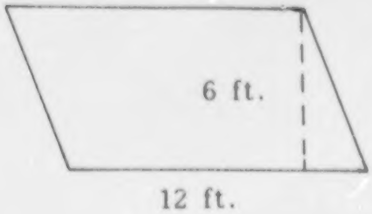

1 1/3 in.
5 1/4 in.


5 cm
5 cm
4 cm
7 cm

22. ____________________

23. ____________________





24. ____________________

25. ____________________

NIVEL 5/EXAMEN 2

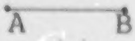
Nombre ______________________________ Fecha ____________________

Profesor ______________________________ Período ____________________

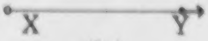
Consejero ______________________________ Calificación ____________________

¿Qué figura geométrica corresponde a cada expresión? Escribe la letra que corresponde a la respuesta correcta.

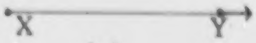
____1. Semirrecta abierta XY



(a)



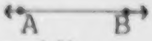
(b)



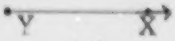
(c)

____2. Rayo X Y

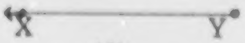
____3. Recta A B



(d)



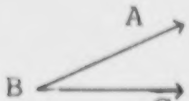
(e)



(f)

____4. Segmento de recta A B

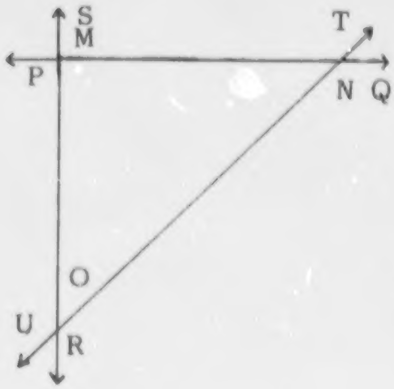
Designa (di el nombre de) este ángulo de dos maneras.



5. ____________________

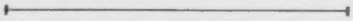
6. ____________________

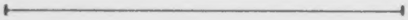
Usando el diagrama a la izquierda, haz las siguientes operaciones con conjuntos. Llena cada espacio en blanco con la letra que corresponda a la respuesta correcta.

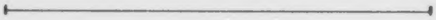


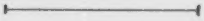
(a) R	(b) $\overline{RM}$	(c) $\overleftrightarrow{SR}$	___7. $\overrightarrow{MR} \cap \overrightarrow{RS}$
(a) ∠ MOU	(b) $\overleftrightarrow{UN}$	(c) $\overleftrightarrow{OM}$	___8. $\overrightarrow{OU} \cup \overrightarrow{OM}$
(a) ∠QNT	(b) $\overleftrightarrow{PQ}$	(c) N	___9. $\overrightarrow{NQ} \cup \overrightarrow{NP}$
(a) $\overrightarrow{NM}$	(b) $\overline{MN}$	(c) $\overrightarrow{MN}$	___10. $\overleftrightarrow{MN} \cap \overrightarrow{MN}$
(a) N	(b) ∠ MNO	(c) ∠NMO	___11. $\overleftrightarrow{ON} \cap \overleftrightarrow{MN}$
(a) M	(b) N	(c) ϕ	___12. $\overrightarrow{MP} \cap \overrightarrow{NQ}$

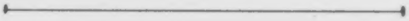
Mide cada segmento a la unidad más próxima (cercana) que se indica.

13.  = _____ (la 1/8 pulgada más próxima)

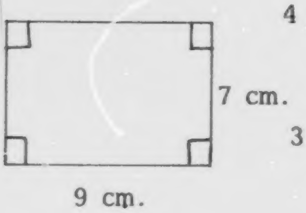
14.  = _____ (el centímetro más próximo)

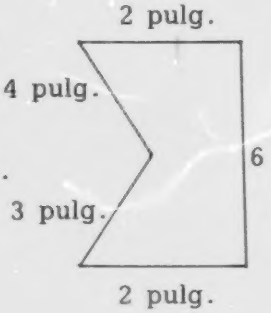
15.  = _____ (la pulgada más próxima)

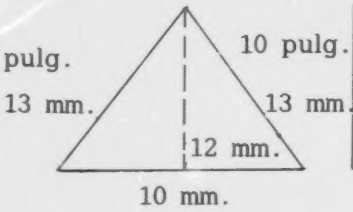
16.  = _____ (el milímetro más próximo)

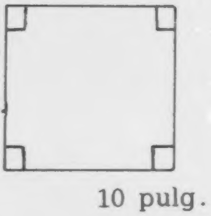
17.  = _____ (la 1/2 pulgada más próxima)

Calcula el perímetro de cada figura.



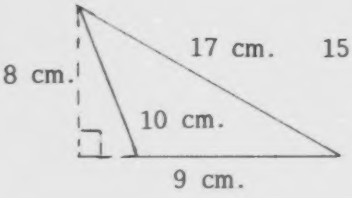

2 pulg.
4 pulg.
6 pulg.
3 pulg.
2 pulg.

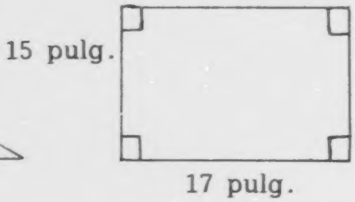

13 mm.
13 mm.
12 mm.
10 mm.

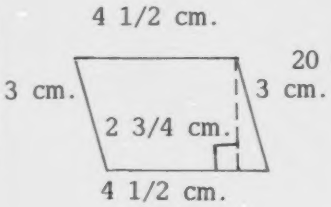

10 pulg.
10 pulg.

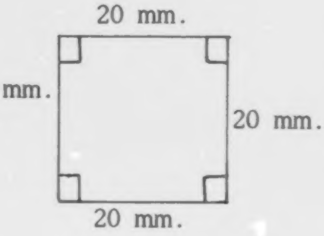
18. __________ 19. __________ 20. __________ 21. __________

Calcula el área de cada figura. (Usa la fórmula.)


17 cm.
8 cm.
10 cm.
9 cm.


15 pulg.
17 pulg.


4 1/2 cm.
3 cm.
3 cm.
2 3/4 cm.
4 1/2 cm.


20 mm.
20 mm.
20 mm.
20 mm.

22. __________ 23. __________ 24. __________ 25. __________

LEVEL 5/TEST 2

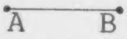
Name ______________________ Date ______________________

Teacher ______________________ Period ______________________

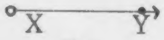
Advisor ______________________ Score ______________________

Match the following. Write the letter that corresponds to the correct answer.

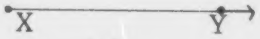
_____1. Open half line X Y



(a)



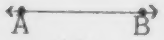
(b)



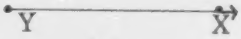
(c)

_____2. Ray X Y

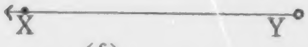
_____3. Line A B



(d)



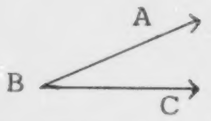
(e)



(f)

_____4. Line segment A B

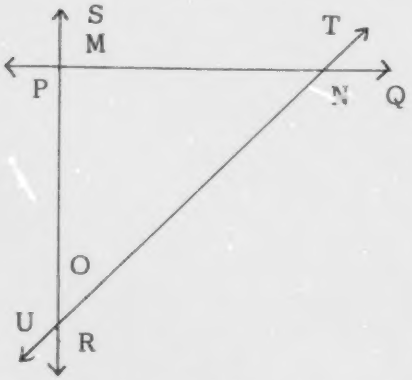
Name the following angle in two ways.



5. ______________

6. ______________

Using the diagram shown, perform the following set operations. In each blank, write the letter that corresponds to the correct answer.



(a) R (b) $\overline{RM}$ (c) $\overleftrightarrow{SR}$ __7. $\overrightarrow{MR} \cap \overrightarrow{RS}$

(a) $\angle MOU$ (b) $\overleftrightarrow{UN}$ (c) $\overleftrightarrow{OM}$ __8. $\overrightarrow{OU} \cup \overrightarrow{OM}$

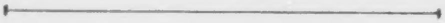
(a) $\angle QNT$ (b) $\overleftrightarrow{PQ}$ (c) N __9. $\overrightarrow{NQ} \cup \overrightarrow{NP}$

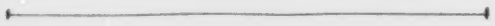
(a) $\overrightarrow{NM}$ (b) $\overline{MN}$ (c) $\overrightarrow{MN}$ _10. $\overleftrightarrow{MN} \cap \overrightarrow{MN}$

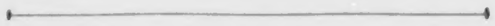
(a) N (b) $\angle MNO$ (c) $\angle NMO$ _11. $\overleftrightarrow{ON} \cap \overleftrightarrow{MN}$

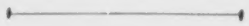
(a) M (b) N (c) $\emptyset$ _12. $\overrightarrow{MP} \cap \overrightarrow{NQ}$

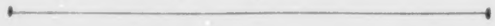
Measure the following line segments to the nearest unit indicated.

13.  = _______ (nearest 1/8 inch)

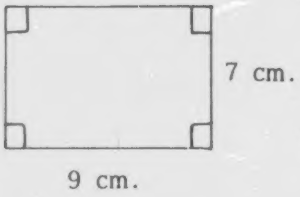
14.  = _______ (nearest centimenter)

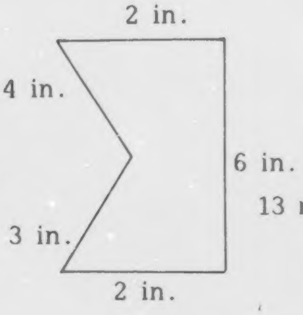
15.  = _______ (nearest inch)

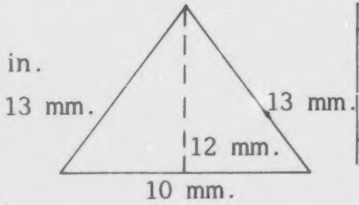
16.  = _______ (nearest millimeter)

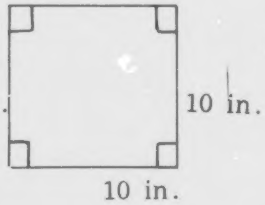
17.  = _______ (nearest 1/2 inch)

Find the perimeter of each figure.



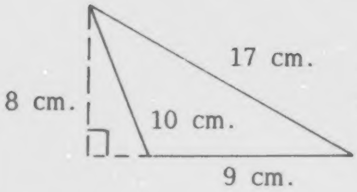

2 in.
4 in.
6 in.
3 in.
2 in.

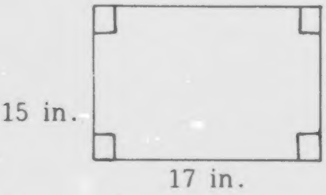

13 mm.
13 mm.
12 mm.
10 mm.

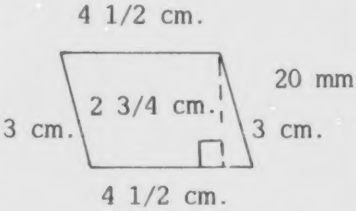


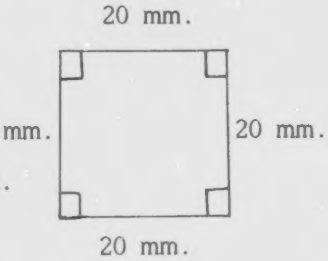
18. _________ 19. _________ 20. _________ 21. _________

Find the area of each figure. (Use the formula.)


17 cm.
8 cm.
10 cm.
9 cm.




4 1/2 cm.
2 3/4 cm.
3 cm.
3 cm.
4 1/2 cm.


20 mm.
20 mm.
20 mm.
20 mm.

22. _________ 23. _________ 24. _________ 25. _________

SUMA DE FRACCIONES

OVERVIEW OF LEVEL 6A

SUMA DE FRACCIONES

OVERVIEW OF LEVEL 6A

Level 6A extends work with fractions, begun in Level 4, to include finding the least common denominator and adding fractions and whole numbers.

The game "Fraction Bingo" (Pattern M6-6) is suggested for use after Lesson 6A-2, 6A-3, and 6A-4 in order to give the students practice in adding fractions having common denominators. The game will take some time for the teacher to prepare.

Excellent practice work in addition, subtraction, multiplication, and division of fractions is available in the following materials, which may be purchased from Houghton Mifflin Co.: INDIVIDUALIZED COMPUTATIONAL SKILLS PROGRAM, Box 3 - Drill and Practice Sheets for Fractions.

BEHAVIORAL OBJECTIVES

1. Given four non-negative proper fractions or mixed numbers, the student will express them in simplest form with 75% accuracy.

2. Given eight sets of non-negative rational numbers, the student will find the sums with 75% accuracy.

3. Given eleven sets of non-negative rational numbers a and b, a b, the student will find the differences with 80% accuracy. (Each difference is defined to be a - b.)

4. Given two stated problems involving addition or subtraction of non-negative rational numbers, the student will solve them with 50% accuracy.

CONTRASTIVE FEATURES

SHORTER METHOD	METHOD USED IN THE STUDENT BOOKLET
$5/7 + 2/3 = \frac{15 + 14}{21} = 29/21 = 1\ 8/21$	$5/7 = 15/21$ $+\ \underline{2/3} = \underline{14/21}$ $29/21 = 1\ 8/21$
$8/9 - 5/6 = \frac{16 - 15}{18} = 1/18$	$8/9 = 16/18$ $-\ \underline{5/6} = \underline{15/18}$ $1/18$

The student who has recently moved to the United States from a Hispanic country will be used to performing addition and subtraction of fractions using a slightly shorter method than that used in the explanations in the student booklet. Both methods are shown on the preceding page.

RATIONAL NUMBERS

LESSON 6A-1

Student Booklet p. 3

CONCEPTS

Equivalent fractions
Simplification of fractions
Changing mixed numerals to improper fractions
Changing improper fractions to mixed numerals

VOCABULARY

equivalente	equivalent
número mixto	mixed number
fracción impropia	improper fraction

RESOURCES

One copy of the following puzzles and sheets of puzzle pieces for each student:

1. Triangle puzzle (Pattern M6-l)
2. Hexagon puzzle (Pattern M6-2)
3. Trapezoid puzzle (Pattern M6-3)
4. Sheet of small triangle pieces (Pattern M6-4), for use with all three of the preceding puzzles
5. Sheet of small trapezoid pieces (Pattern M6-5), for use with the hexagon puzzle

PROCEDURE

El uso de los rompecabezas M6-1, M6-2 y M6-3 puede ayudar a los

The use of puzzles M6-1, M6-2, and M6-3 will help the students under-

estudiantes a comprender el concepto de números mixtos.

Dé a los estudiantes las siguientes instrucciones para el rompecabezas de triángulos M6-1 y haga las preguntas que se indican.

1. Saca los pequeños triángulos y cubre un triángulo grande con esas piezas.
    a. ¿Cuántas piezas se necesitan? (4)
    b. ¿Qué parte de un triángulo grande es un triángulo pequeño? (1/4)
2. Quita dos de los triángulos pequeños y deja dos.
    a. ¿Qué parte del triángulo grande está cubierto? (1/2)
    b. Por lo tanto 1/2 = ?/4 (2)

Repase fracciones equivalentes y la simplificación de fracciones.

3. Saca siete triángulos pequeños y colócalos sobre los dos primeros triángulos grandes.
    a. ¿Cuántos de los triángulos grandes se cubrieron completamente? (1)
    b. ¿Cuántos de los siete triángulos pequeños no se necesitaron para cubrir un triángulo grande? (3)
    c. Puesto que cada uno de los triángulos pequeños representa

stand the concept of mixed numbers.

Give the students the following instructions for triangle puzzle M6-1, asking the indicated questions.

1. Take the small triangle pieces and cover one large triangle with the pieces.
    a. How many pieces are needed? (4)
    b. What part of the large triangle is one small triangle? (1/4)
2. Remove two of the small triangles and leave two.
    a. What part of the large triangle is covered? (1/2)
    b. Therefore 1/2 = ?/4 (2)

Review equivalent fractions and the simplification of fractions.

3. Take seven small triangles and place them on the first two large triangles.
    a. How many of the triangles are completely covered? (1)
    b. How many of the seven small triangles were not needed to cover the one large triangle? (3)
    c. Since each of the small triangles represents one fourth, what do seven of them represent? 7/4

1/4, ¿cuál es la fracción representada por siete de esos triángulos? 7/4

d. Escribe 7/4 en forma de un numeral mixto (1 3/4)

Repase la conversión de fracciones impropias a numerales mixtos.

4. Cubre los dos triángulos grandes con las piezas pequeñas y pon un triángulo pequeño en el tercer triángulo grande.

   a. ¿Cuál es el numeral mixto representado por esos triángulos pequeños? (2 1/4)
   b. ¿Cuántos cuartos representan ellos? (9/4)

Repase la conversión de numerales mixtos a fracciones impropias

5. Llena los espacios vacíos en la hoja de trabajo M6-1.

De modo semejante, guíe a los estudiantes a hacer los rompecabezas del hexágono y del trapezoide, usando los nombres geométricos correspondientes.

Write 7/4 as a mixed numeral. (1 3/4)

Review changing improper fractions to mixed numerals.

4. Cover the two large triangles with the small triangles and place one small triangle on the third large triangle.

   a. What mixed numeral is represented by these small triangles? (2 1/4)
   b. How many fourths do they represent? (9/4)

Review changing mixed numerals to improper fractions.

5. Fill in the blanks on Worksheet M6-1.

In a similar way, guide the students through the hexagon and trapezoid puzzles, using the geometric names.

ADDITION OF FRACTIONS
SIMPLIFYING MIXED NUMBERS
ADDING MIXED NUMBERS WITH COMMON DENOMINATOR

LESSONS 6A-2, 6A-3, 6A-4

Student Booklet p. 7

CONCEPTS

Addition of fractions with common denominators
Simplification of mixed numerals
Addition of mixed numerals with common denominators

VOCABULARY

denominador común	common denominator

RESOURCE

The game "Fraction Bingo" (Pattern M6-6)

PROCEDURE

Para presentar la suma de fracciones, use problemas descriptivos tratando de objetos familiares a los estudiantes, como barras de chocolate. Escriba las fracciones que representan las respuestas en el pizarrón.	Make use of stated problems concerning objects familiar to the students, such as candy bars, to present addition of fractions. Write the fractions that represent the answer on the board.
Ejemplo: María tuvo 2 barras de chocolate. Ella cortó cada una en 5 pedazos (piezas) y se comió 2 pedazos.	Example: María had two candy bars. She cut each into five pieces and then ate two pieces.
¿Cuál es la fracción que representa la parte de la barra que se comió ella? (2/5)	What fraction represents the part of the candy that she ate? (2/5)
Ella le dio a Juan 4 pedazos. ¿Qué parte le dio ella a él? (4/5) ¿Qué parte de las barras de chocolate se comieron los dos juntos?	She gave Juan four pieces. What part did she give him? (4/5). What part of the candy bars did they eat together?

$$\begin{array}{r} 2/5 \\ +\ 4/5 \\ \hline 6/5 = 1\ 1/5 \end{array}$$

Haga notar que los numeradores se suman para dar el numerador de la respuesta, mientras que el denominador permanece igual. Hágales ver que en total los muchachos se comieron 1 1/5 barras de chocolate, porque 6/5 = 1 1/5

Presente un problema semejante al problema anterior, con barras de chocolate cortadas en cuartos y cada niño comiendo 3 pedazos, para ilustrar que
3/4 + 3/4 = 6/4 = 1 2/4 = 1 1/2.

Para introducir la suma de números mixtos, use diagramas, como el diagrama al principio de la Lección 6A-4, pero cambie rápidamente al concepto abstracto. Haga notar que al sumar fracciones o números mixtos puede ser que se necesiten dos pasos para simplificar la respuesta:

1. Convierta cualquier fracción impropia a número mixto.

2. Simplifique la fracción resultante.

Haga que los estudiantes juegen Loteria de fracciones (Modelo M6-6) para practicar la adición de fracciones que tengan denominadores comunes.

$$\begin{array}{r} 2/5 \\ +\ 4/5 \\ \hline 6/5 = 1\ 1/5 \end{array}$$

Emphasize that the numerators are added to give the numerator of the answer, while the denominators of all three fractions remain the same. Point out that together the children ate 1 1/5 candy bars, since 6/5 = 1 1/5

Present a similar problem, with a candy bar cut into fourths and each child eating three pieces to illustrate that

3/4 + 3/4 = 6/4 = 1 2/4 = 1 1/2.

Use diagrams like the one at the beginning of Lesson 6A-4 to introduce the addition of mixed numbers, but quickly move to the abstract concept. Emphasize that in the addition of fractions or mixed numbers, two steps may be required to simplify the answers:

1. Change any improper fraction to a mixed number.

2. Simplify the remaining fraction.

Have the students play "Fraction Bingo" (Pattern M6-6) in order to practice addition of fractions which have common denominators.

FINDING COMMON DENOMINATORS
LEAST COMMON DENOMINATOR
SHORTCUT TO ADDING FRACTIONS WITH DIFFERENT DENOMINATORS

LESSON 6A-5, 6A-6, 6A-7

Student Booklet p. 27

CONCEPTS

Finding a common denominator
Finding the least common denominator
Adding fractions after changing them to fractions having a common denominator

VOCABULARY

mínimo común denominador	least common denominator

RESOURCE

Worksheet M6-7

PROCEDURE

Introduzca el concepto del común denominador, presentándoles problemas descriptivos que tratan de objetos bien conocidos por parte de los estudiantes.

Introduce the concept of common denominator by presenting stated problems involving objects that are familiar to the students.

Ejemplos - Examples

1. Si Pepe se come 1/3 de un pastel de chocolate en el almuerzo y 1/4 del mismo en la comida, ¿qué parte del pastel se habrá comido?
2. Si Ana obtuvo 1/4 de los caramelos de la piñata y José obtuvo 2/7, ¿quién alcanzó más?

1. If Pepe eats 1/3 of a chocolate pie for lunch and 1/4 of it for supper, how much of the pie has he eaten?
2. If Anna got 1/4 of the candy in the piñata and José got 2/7, who got more?

Estos problemas los ayudarán a los estudiantes a ver la necesidad de un común denominador. Después de que los estudiantes hayan aprendido a calcular denominadores comunes, haga que vuelvan a ver los problemas anteriores para resolverlos.

These problems should help the students see the need for a common denominator. Later, after the students have learned how to find common denominators, have them return to the preceding problems and solve them.

Para preparar a los estudiantes a calcular el común denominador, ayúdeles a completar la Hoja de trabajo M6-7, escribiendo todos los factores de números del 1 al 24.

To prepare the students to find common denominators, help them complete Worksheet M6-7, giving all the factors of the numbers from 1 through 24.

Después déles varios ejemplos de problemas de suma, cada uno con denominadores que sean todos factores del mismo número, menor que 25.

Then give several examples of addition problems, each of which has denominators which are all factors of a specified number less than 25.

Ejemplos - Examples

3/5	3/7	3/10	1/3	3/5	1/3
+1/4	+4/5	+1/5	+2/9	+2/3	+5/8

Después de que los estudiantes hagan varios de estos problemas, déles algunos en los cuales el mínimo común denominador sea mayor que 24, de manera que no dependan de la hoja de factores para ayudarles. Pídales que calculen el denominador común usando el método de enumerar los múltiplos del denominador mayor. (Lección 6A-5)

After the students work several problems of this type, have them work some in which the least common denominator is greater than 24, so that they cannot depend on the factor sheet to help them. Have them find the common denominator using the method of listing the multiples of larger denominator. (Lesson 6A-5)

Ejemplos - Examples

5/9	2/3	1/6	9/20	3/20	6/25
+7/12	+7/10	+4/7	+5/6	+1/8	+1/10

Explíqueles cómo determinar el mínimo común denominador mediante el método de factores presentado en la Lección 6A-6 y hágales resolver problemas de suma utilizando este método.

Explain how to find the least common denominator by the method of factoring presented in Lesson 6A-6 and have them solve addition problems, making use of this method.

Ejemplo - Example

$$\begin{array}{l}1/16\\ \underline{3/20}\end{array} \qquad \begin{array}{rl}16 &= 2 \times 2 \times 2 \times 2 = 2^4\\ 20 &= 2 \times 2 \times 5 = 2^5 \times 5\\ \text{LCM} &= 2^4 \times 5\\ &= 16 \times 5\\ &= 80\end{array} \qquad \begin{array}{rl}1/16 \times 5/5 &= 5/80\\ \underline{+3/20 \times 4/2} &= \underline{12/80}\\ & \quad 17/80\end{array}$$

Haga notar que el mínimo común denominador es el mínimo común múltiplo.

Ponga énfasis al explicar que el proceso de sumar fracciones hallando el mínimo común denominador se compone de cuatro pasos:

1. Encontrar el mínimo común denominador.
2. Convertir las fracciones dadas a fracciones equivalentes teniendo ese denominador.
3. Sumar los numeradores de las nuevas fracciones.
4. Simplificar la respuesta.

Anime a los estudiantes a usar el mínimo común denominador mejor qué su múltiplo. Resuelva 2 ó 3 problemas usando un múltiplo del mínimo común denominador como el común denominador, y muestre que la respuesta requiere más simplificación que la respuesta que obtiene usted usando el mínimo común denominador.

Emphasize the fact that the least common denominator is the least common multiple.

Stress that four steps are involved in the process of adding fractions when it is necessary to find a common denominator:

1. Finding the least common denominator.
2. Changing the given fractions to equivalent fractions having that denominator.
3. Adding the numerators of the new fractions.
4. Simplifying the answers.

Encourage the students to use the least common denominator rather than a multiple of it. Solve two or three problems, using a multiple of the least common denominator as the common denominator, and show that the answer requires more simplification than the answer obtained by using the least common denominator.

Ejemplo - Example

USANDO UN MÚLTIPLO DEL MÍNIMO COMÚN DENOMINADOR	USING A MULTIPLE OF THE LEAST COMMON DENOMINATOR
3/4 = 18/24 +5/6 = 20/24 38/24 = 1 14/24 = 1 7/12	3/4 = 9/12 +5/6 = 10/12 19/12 = 1 7/12

ADDING MIXED NUMBERS WITH DIFFERENT DENOMINATORS

LESSON 6A-8

Student Booklet, p. 43

CONCEPT

Adding mixed numbers with different denominators

VOCABULARY

números mixtos	mixed numbers

RESOURCES

None

PROCEDURE

Presente varios problemas descriptivos en los cuales se suman numerales mixtos.

Present several stated problems, which involve the addition of mixed numerals.

Ejemplos - Examples

1. Marlene tiene 3 1/2 yardas de tela (material) y su abuela le da 4 2/3 yardas más. ¿Cuántas yardas en total tiene ella?

   Marlene has 3 1/2 yards of fabric, and her grandmother gives her 4 2/3 yards more. How much fabric does she have altogether?

2. Jaime tiene 6 3/8 libras de maíz y compra 3 1/2 libras más. ¿Cuántas libras tiene él ahora?

   James has 6 3/8 pounds of corn and he buys 3 1/2 more pounds. How many pounds does he now have?

Haga que los estudiantes den una respuesta aproximada. Después ayúdeles a ver que, si quieren hallar una respuesta exacta, deberán sumar las partes fraccionales de los números mixtos, y que antes de hacer la suma, deberán calcular el mínimo común denominador. Resuelva con sus estudiantes los dos ejemplos anteriores.

Have the students estimate an approximate answer. Then help them to see, that in order to find an exact answer, they will need to add the fractional parts of the mixed numbers and that, before they can perform this addition, they will need to find the least common denominator. Work the preceding two examples with the students.

Insista en que los estudiantes siempre escriban problemas de suma de la manera siguiente:

Always require the students to write addition problems in the following manner:

$$\begin{array}{rcr}
2\ 3/8 & = & 2\ 3/8 \\
\underline{+3\ 1/4} & = & \underline{3\ 2/8} \\
 & & 5\ 5/8
\end{array}$$

en lugar de

rather than

$$\begin{array}{rcl}
2\ 3/8 & = & 3/8 \\
\underline{+3\ 1/4} & = & \underline{2/8} \\
5 & & 5/8 = 5\ 5/8
\end{array}$$

El último método utiliza proposiciones incorrectas y si se usa en problemas de sustracción, resultarán muchos errores.

The latter methods make use of incorrect statements and if it is used later in subtraction problems, many errors will result.

STATED PROBLEMS

LESSON 6A-9

Student Booklet p. 47

CONCEPT

Solving stated problems involving addition of rational numbers

VOCABULARY

problemas descriptivos	stated problems

RESOURCES

None

PROCEDURE

Lea varios problemas descriptivos con sus estudiantes y ayúdeles a escoger palabras claves que indican adición, como total y suma. Ponga énfasis en el hecho de que el estudiante tiene que leer el problema completo con cuidado para poder encontrar las palabras que indican adición. Muchas veces una palabra o frase dada en inglés no tiene equivalente en español. Por lo tanto, listas paralelas de palabras claves en dos idiomas no se pueden entender debido a que se encuentran fuera del contexto del problema descriptivo.

Pida a varios estudiantes que hagan problemas tratando de la suma de fracciones y que señalen las palabras claves. Usted puede sugerirles que usen ideas como libras de caramelos o bombones, yardas de tela (material), altura de muchachos, etc.

Read several stated problems with the students and help them select key words or phrases that indicate addition, such as total and sum. Stress that the students must read the entire problem carefully and understand its meaning in order to be able to find the words which indicate addition. In many cases, an exact equivalent for a particular word or phrase in English does not exist in Spanish. Therefore, comparative lists of key words of the two languages, since they are outside the context of a word problem, are misleading.

Ask several students to make up problems involving addition of fractions and to point out the key words. You may want to suggest that they use items such as pounds of candy yards of fabric, children's heights, etc.

PROPERTIES

LESSON 6A-10

Student Booklet p. 51

CONCEPTS

Properties of rational numbers:

Commutative property of addition
Associative property of addition
Distributive property of multiplication over addition
Identity property of addition

VOCABULARY

propiedad asociativa	associative property
propiedad conmutativa	commutative property
propiedad de identidad de la adición	identity property of addition
propiedad distributiva	distributive property

RESOURCE

Worksheet M6-8

PROCEDURE

Repase las cuatro propiedades presentadas en los Conceptos, demonstrándolas mediante ejemplos que usan números enteros. Después repase el hecho de que la suma de números racionales es simplemente volver a escribir las fracciones de modo que tengan los mismos denominadores y sumar los numeradores, que son números enteros. Por lo tanto todas las propiedades se aplican a la suma de números enteros se pueden aplicar también a los números racionales. Demuéstrelo, usando ejemplos como el siguiente:

Review the four properties listed in the Concepts, illustrating them with examples which use whole numbers. Then review the fact that addition of rational numbers is simply a matter of rewriting the fractions so that they have the same denominator and then adding the numerators, which are whole numbers. Therefore all the properties that apply to addition of whole numbers apply to rational numbers. Illustrate this using examples such as the following:

Propiedad conmutativa - Commutative Property

Por lo tanto - Therefore,

$$2 + 3 = 3 + 2$$

$$5 = 5$$

$$2/7 + 3/7 = 3/7 + 2/7$$

$$5/7 = 5/7$$

Utilice el mismo procedimiento para demostrar las otras propiedades.

Use the same procedure to illustrate the remaining properties.

Haga que los estudiantes completen la hoja de trabajo M6-8 para practicar la adición de fracciones que tengan denominadores distintos.

Have the students complete Worksheet M6-8 in order to practice addition of fractions having different denominators.

RESTA DE FRACCIONES

OVERVIEW OF LEVEL 6B

RESTA DE FRACCIONES

OVERVIEW OF LEVEL 6B

Level 6B includes subtraction of fractions and mixed numerals. It is important to spend an adequate amount of time on the topic of borrowing or regrouping, since many students have difficulty in learning this process.

SUBTRACTING FRACTIONS WITH A COMMON DENOMINATOR SUBTRACTING MIXED NUMBERS WITH A COMMON DENOMINATOR

LESSONS 6B-1, 6B-2

Student Booklet p. 3

CONCEPTS

Subtracting fractions with a common denominator
Subtracting mixed numbers with a common denominator

VOCABULARY

resta de fracciones con denominador común	subtracting fractions with a common denominator

RESOURCES

None

PROCEDURE

Para introducir el concepto de la resta de fracciones y números mixtos, preséntenles problemas orales que sean de interés para los estudiantes. Los problemas deben tratar de la resta de fracciones que tengan denominadores comunes. Escoja problemas que no requieran la reagrupación (prestar). Ayude a los estudiantes a comprender el proceso de la sustracción escri-

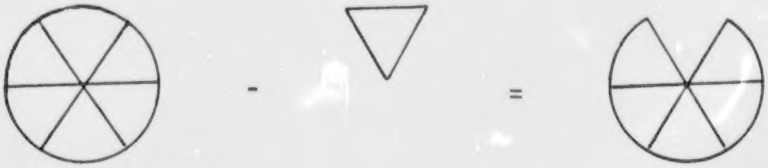
To introduce the concept of subtracting fractions and mixed numbers, present meaningful word problems involving subtraction of fractions which have a common denominator. Select problems which do not require borrowing. Help the students understand the subtraction process by writing the problems on the chalkboard and making sketches to represent the fractions.

biendo los problemas en la pizarra y haciendo dibujos para representar las fracciones.

Ejemplo 1 - Example 1

a. La madre de Juan cortó un pastel en 6 partes iguales. Ella puso una de las partes en el almuerzo (lonche) de Juan. ¿Qué fracción del pastel quedó?

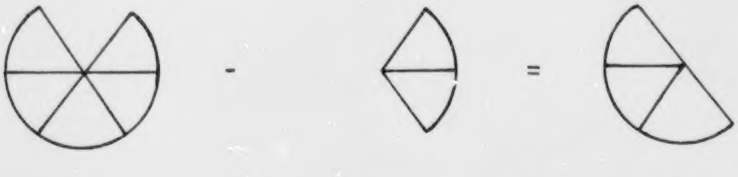
a. Juan's mother cut a pie into 6 equal pieces. She put one piece in Juan's lunch. What fraction of the pie was left?



6/6 - 1/6 = 5/6

b. Después ella le dio al padre de Juan dos de las partes restantes. ¿Qué fracción del pastel quedó?

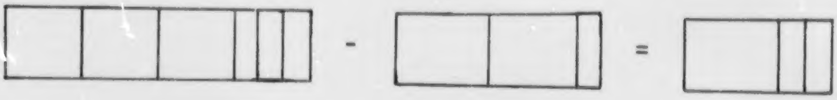
b. She then gave two of the remaining pieces to Juan's father. What fraction of the pie was left?



5/6 - 2/6 = 3/6

2. María tenía 3 3/4 yardas de tela (material) y gastó 1 1/4 yardas en hacer un vestido. ¿Cuántas yardas de la tela le quedaron?

2. Mary has 3 3/4 yards of fabric (material) and used 1 1/4 yards to make a dress. How many yards of fabric were left?



3 3/4 - 2 1/4 = 1 2/4 or 1 1/2

SUBTRACTING FRACTIONS WITH DIFFERENT DENOMINATORS
SUBTRACTING MIXED NUMBERS WITH DIFFERENT DENOMINATORS

LESSONS 6B-3, 6B-4

Student Booklet p. 11

CONCEPTS

Subtracting fractions with different denominators
Subtracting mixed numbers with different denominators

VOCABULARY

None

RESOURCES

None

PROCEDURE

Introduzca el concepto de la resta de fracciones y números

Introduce the concept of subtracting fractions and mixed numbers with different denominators by

mixtos que tengan denominadores distintos presentándoles problemas orales que sean de interés para los estudiantes. Al buscar problemas de resta de números mixtos, escoja aquellos en los cuales el minuendo contenga una fracción mayor que la del sustraendo.

presenting meaningful word problems. For the problems involving mixed numbers, select ones in which the minuend contains a fraction larger than that of the subtrahend.

Ejemplo 1 - Example 1

Una tarde Roberto y Guillermo fueron en una excursión a pie. Roberto caminó 4/5 de milla y Guillermo caminó 1/2 de milla. ¿Cuánto más caminó Roberto que Guillermo?

Bob and Bill went hiking one afternoon. Bob hiked 4/5 of a mile and Bill 1/2 of a mile. How much farther did Bob hike than Bill?

4/5 = 8/10

-1/2 = 5/10

3/10

Ejemplo 2 - Example 2

Carlos mide 5 3/4 pies de altura y Anita mide 4 2/3 pies. ¿Cuál es la diferencia en la altura de los dos?

Carl is 5 3/4 feet tall and Anita is 4 2/3 feet tall. What is the difference in their heights?

5 3/4 = 5 9/12

-4 2/3 = -4 6/12

1 3/12 = 1 1/4

SUBTRACTING A FRACTION FROM A WHOLE NUMBER
SUBTRACTING A MIXED NUMBER FROM A WHOLE NUMBER

LESSON 6B-5, 6B-6

Student Booklet p. 23

CONCEPTS

Subtracting a fraction from a whole number
Subtracting a mixed number from a whole number
Subtracting a mixed number from a mixed number

VOCABULARY

None

RESOURCE

Worksheet M6-9

PROCEDURE

Utilice las siguientes preguntas para ayudar a los estudiantes a completar la Hoja de trabajo M6-9 en la cual se introducen los conceptos de esta presentación. Demuestre los problemas en el pizarra, mientras que los estudiantes escriben en la hoja de trabajo.

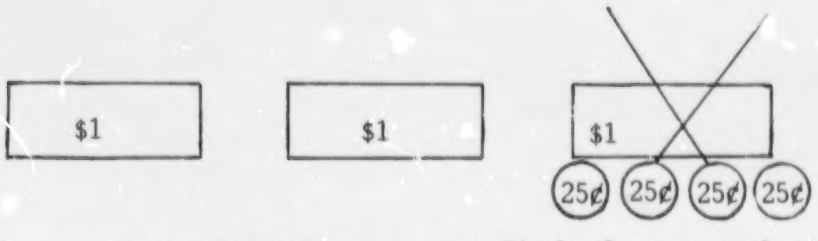
1a. ¿Tienes dinero suficiente para comprar una coca? (Sí)
b. ¿Qué tienes que hacer antes de que puedas comprarla? (Tener cambio)

Deje que algún estudiante tache uno de los tres dólares dibujados en la pizarra y escriba o dibuje su valor en cuatro pesetas (monedas de 25¢).

Make use of the following questions to help the students complete Worksheet M6-9, which introduces the concepts of this presentation. Illustrate the problems on the chalkboard while the students write on their worksheets.

1a. Do you have enough money to buy a cola? (Yes)
b. What must you do before you can buy it? (Get change)

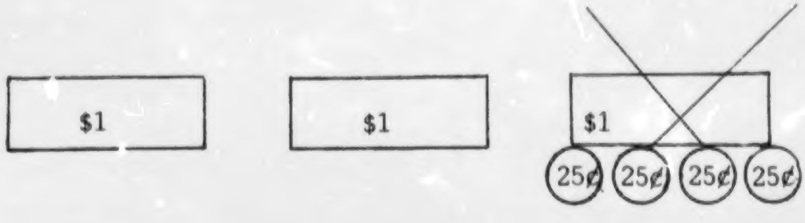
Have a student mark out one of the three dollars drawn on the chalkboard and draw four quarters to replace it.



c.	Dibuja un círculo alrededor de lo que se ha gastado. (25¢)	c.	Circle the money that is spent. (25¢)
d.	¿Cuánto te ha sobrado? (Dos dólares y tres pesetas (monedas de 25¢) o 2 3/4 dólares.	d.	How much do you have left? (Two dollars and three quarters or 2 3/4 dollars)
e.	Escribe un problema de resta para ilustrarlo.	e.	Write a subtraction problem to illustrate this.

$$\begin{array}{rcr} 3 & = & 2\ 4/4 \\ \underline{-\ \ 1/4} & = & \underline{1/4} \\ & & 2\ 3/4 \end{array}$$

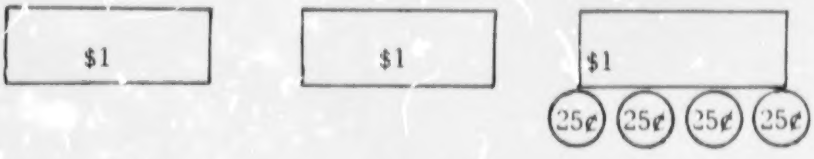
2a.	¿Tienes dinero suficiente para comprar un libro? (Sí). Vamos a buscar cambio antes de empezar.	2a.	Do have enough money to buy a book? (Yes) Let's get change before we began.
	Haga que un estudiante tache un dólar y dibuje cuatro pesetas.		Have someone mark out one of the dollars and draw four quarters to replace it.



b. Dibuja un círculo alrededor de lo que se ha gastado. (Un dólar y una peseta).	b. Circle what is spent. (One dollar and one quarter.)
c. ¿Cuánto te ha sobrado? (Un dólar y tres pesetas o 1 3/4 dólares).	c. How much do you have left? (One dollar and three quarters or 1 3/4 dollars.)
d. Escribe un problema de resta para ilustrarlo.	d. Write a subtraction problem to illustrate this.

$$\begin{array}{rcr} 3 & = & 2\ 4/4 \\ -\ \underline{1\ 1/4} & = & -\ \underline{1\ 1/4} \\ & & 1\ 3/4 \end{array}$$

3a. ¿Tienen ustedes dinero suficiente para comprar el pan dulce? (Sí).	3a. Do you have enough money to buy the sweet roll? (Yes.)
Vamos a cambiar el dinero antes de empezar.	Let's make change before we begin.



b. Ahora, ¿cuánto dinero tienes? (Dos dólares y cuatro pesetas).	b. Now how much do you have? (Two dollars and four quarters.)
c. Dibuja un círculo alrededor de lo que se ha gastado. (Un dólar y dos pesetas o 1 1/2 dólares).	c. Circle the money that is spent. (One dollar and two quarters or 1 1/2 dollars.)
d. ¿Cuánto te ha sobrado? (Un dólar y dos pesetas o 1 1/2 dólares).	d. How much do you have left? (One dollar and two quarters or 1 1/2 dollars.)

e. Escribe un problema de resta para ilustrarlo.

e. Write a subtraction problem to illustrate this.

$$\begin{array}{rcr} 3 & = & 2\ 2/2 \\ \underline{-1\ 1/2} & = & \underline{-1\ 1/2} \\ & & 1\ 1/2 \end{array}$$

SUBTRACTING A MIXED NUMBER FROM A MIXED NUMBER

LESSON 6B-7

Student Booklet p. 35

CONCEPT

Subtracting mixed numbers with common denominators, using regrouping (borrowing).

VOCABULARY

None.

RESOURCES

None.

PROCEDURE

Introduzca el concepto de la resta de números mixtos presentándoles un problema oral que trata de dinero.

Introduce the concept of subtracting mixed numbers by presenting a word problem involving money.

Ejemplo

Tienes 4 billetes de un dólar cada uno peseta. Si compras un cometa (huila), pagando $1.75

Example

You have four dollar bills and one quarter. If you buy a kite for $1.75, much money will you have left?

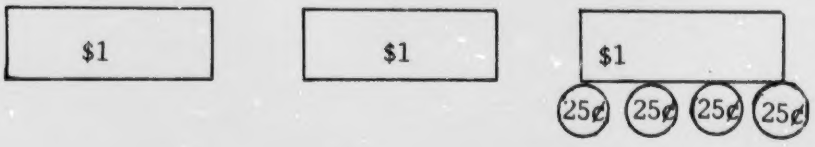
por ella, ¿cuánto dinero le sobra?

a. Vamos a buscar cambio antes de empezar.

Haga que un estudiantes tache un dólar y dibuje cuatro pesetas.

a. Let's get change before we begin.

Have someone mark out one of the dollars and draw four quarts to replace it.



b. Dibuja un círculo alrededor de lo que se ha gastado. (Un dólar y tres pesetas o 1 3/4 dólares).

c. ¿Cuánto te ha sobrado? (Dos dólares y dos pesetas o 2 1/2 dólares).

d. Escribe un problema de resta para ilustrarlo.

b. Circle what is spent. (One dollar and three quarters or 1 3/4 dollars.)

c. How much do you have left? (Two dollars and two quarters or 2 1/2 dollars.)

d. Write a subtraction problem to illustrate this.

$$\begin{array}{rcr} 4\ 1/4 & = & 3\ 5/4 \\ \underline{-1\ 3/4} & = & \underline{-1\ 3/4} \\ & & 2\ 2/4 = 1\ 1/2 \end{array}$$

Haga que los estudiantes vayan a la pizarra para practicar la resta de números mixtos con denominadores comunes en problemas que requieran reagrupación (préstamo).

Have the students go to the board and practice subtracting mixed numbers with common denominators in problems where borrowing is necessary.

MIXED NUMBERS WITH SPECIAL PROBLEMS

LESSON 6B-8

Student Booklet p. 40

CONCEPT

Subtracting mixed numbers with different denominators using regrouping (borrowing).

VOCABULARY

None.

RESOURCE

Worksheet M6-10.

PROCEDURE

Después de repasar denominadores comunes, utilice un problema oral para explicar cómo restar números mixtos con denominadores distintos usando reagrupación (el préstamo).

Ejemplo

Juanita hizo galletas usando 2 1/2 tazas de azúcar y María hizo dulces usando 5 1/3 tazas de azucar. ¿Cuánta azúcar más usó María que Juanita?

Haga que lo estudiantes completen la Hoja de trabajo M6-10 para practicar la adición y la sustracción de fracciones y números mixtos.

After reviewing common denominators, make use of a word problem to introduce the concept of subtracting mixed numbers with different denominators using regrouping (borrowing).

Example

Jane made sone cookies, using 2 1/2 cups of sugar, and Mary made some divinity, using 5 1/3 cups of sugar. How much more sugar did Mary use than Jane?

Have the students complete Worksheet M6-10 in order to practice both addition and subtraction of fractions and mixed numbers.

STATED PROBLEMS

LESSON 6B-9

Student Booklet p. 47

CONCEPT

Stated problems involving subtraction of rational numbers

VOCABULARY

None

RESOURCES

None

PROCEDURE

Lea varios de los problemas descriptivos de la Lección 6B-9 (Manual del estudiante 6B) con los estudiantes y ayúdeles a escoger palabras claves que indican la sustracción, como, "¿cuánto le sobró?", y "la diferencia de".

Read several of the stated problems of Lesson 6B-9 (Student Booklet 6B) with the students and help the students select key words that indicate subtraction, such as "how much is left?" and "the difference of."

Después presénteles problemas descriptivos que tratan de la adición o de la sustracción. No pida que los estudiantes resuelvan los problemas. Haga que solamente digan qué operación deberán de usar para resolverlos.

Then present some stated problems involving addition or subtraction. Do not have the student solve the problems. Simply have them tell which operation they should perform in order to solve them.

Ejemplo 1

La madre de Juanita compró 3 1/8 yardas de tela (material) para hacer un vestido. El patrón pidió 2 3/4 yardas. Después de coser el vestido, ¿cuánta tela le sobró?

Example 1

Jane's mother bought 3 1/8 yards of fabric (material) to make a dress. The pattern called for 2 3/4 yards. After she made the dress, how much fabric was left over?

3 1/8

-2 3/4

Ejemplo 2

José corrió 5 3/4 millas en su motocicleta y después caminó 2 1/2 millas a través de la selva (bosque) para llegar al campamento. ¿Cuántas millas recorrió en total?

Example 2

Joe rode 5 3/4 miles on his motor bike and then walked 2 1/2 miles through the forest to reach the campsite. How many miles in all did he travel?

5 3/4

+2 1/2

CLAVE/ANSWER KEY

MANUAL DEL ESTUDIANTE
STUDENT BOOKLET

NIVEL 6A/LEVEL6A

CLAVE/ANSWER KEY

MANUAL DEL ESTUDIANTE/STUDENT BOOKLET

NIVEL 6A / LEVEL 6A

EJERCICIO 6A-1/EXERCISE 6A-1, pages 4-5

1. 6
2. 14
3. 3
4. 3
5. 6
6. 7
7. 2/3
8. 11/50
9. 1/3
10. 5/16
11. 6/7
12. 1/4
13. 7/2
14. 62/7
15. 35/8
16. 55/8
17. 11/2
18. 17/5
19. 10 3/4
20. 2 17/20
21. 3 1/5
22. 9 5/6
23. 3 3/8
24. 4 73/100

EJERCICIO 6A-2/EXERCISE 6A-2, pages 14-15

1. 5/8
2. 3/5
3. 4/9
4. 4/4 = 1
5. 7/10
6. 5/6
7. 2/3
8. 11/12
9. 9/10
10. 15/15 = 1
11. 9/20
12. 8/9
13. 9/12 = 3/4
14. 13/20

EJERCICIO 6A-2/EXERCISE 6A-2 (Cont.), pages 14-15

15. 2/3
16. 15/16
17. 3/4
18. 9/10
19. 4 1/2
20. 1 1/4
21. 1 1/5
22. 1 2/3
23. 1 1/4
24. 1 3/10

EJERCICIO 6A-3/EXERCISE 6A-3, pages 18-19

1. 5 1/2
2. 7 2/3
3. 6 1/2
4. 2 1/5
5. 5
6. 4
7. 2
8. 9
9. 3 1/6
10. 11 1/2
11. 7 3/5
12. 11 5/12

EJERCICIO 6A-4/EXERCISE [illegible]-4, pages 24-25

1. 5 1/4
2. 4 7/8
3. 9
4. 16 5/12
5. 17 1/4
6. 8 1/6
7. 12 1/3
8. 12 1/2
9. 23 3/4
10. 11
11. 14 4/9
12. 7 2/5
13. 4 1/4
14. 16 1/8
15. 13 1/3
16. 29
17. 8 5/6
18. 8 4/5
19. 12 1/2
20. 6 2/9

EJERCICIO 6A-4/EXERCISE 6A-4 (Cont.), pages 24-25

21. 10 1/3
22. 14 5/6
23. 4 15/16
24. 15
25. 5 3/4
26. 14 2/3
27. 10 1/2
28. 10 [illegible]/12
29. 8 15/17
30. 12 11/15
31. 16 2/9
32. 14 3/10
33. 39
34. 13 1/6
35. 15 1/4
36. 21 1/3

EJERCICIO 6A-5/EXERCISE 6A-5, pages 32-33

1. 3/8
2. 8/9
3. 7/9
4. 1 7/12
5. 1/2
6. 5/6
7. 1 5/21
8. 1 1/12
9. 1 2/15
10. 1 3/8
11. 1 13/30
12. 1 8/21
13. 5/12
14. 14/15
15. 1 7/30
16. 61/70
17. 17/24
18. 1 17/30
19. 1 1/6
20. 1 1/12

EJERCICIO 6A-6/EXERCISE 6A-6, pages 36-37

1. 30
2. 6
3. 25
4. 24
5. 60
6. 42
7. 40
8. 20

EJERCICIO 6A-6/EXERCISE 6A-6 (Cont.), pages 36-37

9. 30
10. 70
11. 48
12. 144
13. 72
14. 42
15. 18
16. 24
17. 840
18. 12
19. 80
20. 60

EJERCICIO 6A-7/EXERCISE 6A-7, pages 40-41

1. 2/15
2. 1 1/6
3. 3/5
4. 17/24
5. 3/5
6. 2/7
7. 1 7/40
8. 1 1/20
9. 19/30
10. 12/35
11. 7/16
12. 29/72
13. 7/36
14. 1/2
15. 11/18
16. 5/6
17. 499/840
18. 1 7/12
19. 1 1/10
20. 1 13/60

EJERCICIO 6A-8/EXERCISE 6A-8, pages 44-45

1. 8 5/8
2. 10 17/40
3. 12 1/2
4. 27 32/63
5. 82 41/45
6. 86 57/84
7. 35 49/99
8. 29 31/40
9. 13 23/30
10. 12 11/28

EJERCICIO 6A-8/EXERCISE 6A-8 (Cont.), pages 44-45

11. 5 5/8
12. 7 11/15
13. 26 3/8
14. 33 1/12
15. 10 53/60
16. 10 41/72

EJERCICIO 6A-9/EXERCISE 6A-9, pages 48-49

1. 4 1/6 yds.
2. 3 8/15 lbs.
3. 1 5/24 pulgadas - 1 5/24 inches
4. 14 1/8 yds.
5. 2 1/3 hrs.
6. 6 1/2 cuadras - 6 1/2 blocks
7. 7 7/15 millas - 7 7/15 miles
8. 7 1/4 hrs.

EJERCICIO 6A-10/EXERCISE 6A-10, pages 54-57

1. 3/5 + 1/2
2. (1/2 x 3/4) + (1/2 x 1/8)
3. (5/6 + 1/2) + 2/3
4. Propiedad de identidad de la adición
   Additive identity property
5. Propiedad asociativa
   Associative property
6. Propiedad distributiva
   Distributive property
7. Propiedad conmutativa
   Conmutative property
8. Propiedad conmutativa
   Conmutative property
9. Propiedad conmutativa
   Conmutative property
10. Propiedad distributiva
    Distributive property
11. Propiedad asociativa
    Associative property
12. Propiedad conmutativa
    Conmutative property
13. Propiedad asociativa
    Associative property

REPASO 6A/REVIEW 6A, pages 58-61

1. 2/3
2. 11/50
3. 1/3
4. 6 1/2
5. 2 1/2
6. 8 3/4

REPASO 6A/REVIEW 6A (Cont.), pages 58-61

7. 5 1/2
8. 10 5/6
9. 15 11/13
10. 20
11. 28
12. 80
13. 6
14. 153
15. 9
16. 18
17. 28
18. 45
19. 1
20. 1
21. 7
22. 1 1/24
23. 239/400
24. 1 11/90
25. 7 1/4
26. 26 17/24
27. 7 1/2
28. 11 1/4
29. 2 1/5
30. 48 5/21

CLAVE/ANSWER KEY

MANUAL DEL ESTUDIANTE
STUDENT BOOKLET

NIVEL 6B/LEVEL 6B

CLAVE / ANSWER KEY

MANUAL DEL ESTUDIANTE/STUDENT BOOKLET

NIVEL 6B / LEVEL 6b

EJERCICIO 6B-1/EXERCISE 6B-1, pages 6-7

1. 1/6
2. 3/9 = 1/3
3. 4/8 = 1/2
4. 2/9
5. 3/10
6. 3/6 = 1/2
7. 4/5
8. 5/10 = 1/2
9. 3/7
10. 3/8
11. 8/12 = 2/3
12. 5/10 = 1/2
13. 15/20 = 3/4
14. 9/18 = 1/2
15. 8/5 = 1 3/5
16. 7/12
17. 7/2 = 3 1/2
18. 2/5
19. 4/8 = 1/2
20. 5/9

EJERCICIO 6B-2/EXERCISE 6B-2, pages 8-9

1. 3 2/9
2. 2 5/7
3. 5 5/10 = 5 1/2
4. 4 2/8 = 4 1/4
5. 2 3/6 = 2 1/2
6. 1
7. 2 3/7
8. 2 4/9
9. 5 5/8
10. 5 8/17
11. 11 9/15 = 11 3/5

12 27 24/36 = 27 2/3

EJERCICIO 6B-3/EXERCISE 6B-3, pages 14-15

1. 1/15
2. 5/12
3. 1/10
4. 1/2
5. 2/10 = 1/5
6. 1/12
7. 32/60 or 16/30 = 8/15
8. 11/24
9. 14/24 = 7/12
10. 11/18
11. 1/4
12. 2/16 = 1/8
13. 2/18 = 1/9
14. 7/15
15. 3/14
16. 7/20
17. 5/36
18. 8/42 = 4/21
19. 3/15 = 1/5
20. 7/14 = 1/2

EJERCICIO 6B-4/EXERCISE 6B-4, pages 20-21

1. 2 1/12
2. 2 5/24
3. 3 11/24
4. 2 7/12
5. 3 46/80 = 3 23/40
6. 2 11/18
7. 1 27/60 = 1 9/20
8. 6 35/60 = 6 7/12
9. 1 25/30 = 1 5/6
10. 6 4/90 = 6 2/45
11. 17 1/5
12. 3 1/20
13. 1 14/45
14. 21 5/30 = 21 1/6
15. 5 5/30 = 5 1/6
16. 4 13/24
17. 11 23/48
18. 15 21/60 = 15 7/20
19. 4 4/12 = 4 1/3
20. 10 5/10 = 10 1/2

EJERCICIO 6B-5/EXERCISE 6B-5, pages 26-27

1. 4 1/4
2. 6 1/8
3. 2 3/12 = 2 1/4
4. 7 3/7
5. 19 7/21 = 19 1/3
6. 35 12/15 = 35 4/5
7. 46 9/17
8. 20 1/16
9. 5 6/16
10. 3/8
11. 3 9/16
12. 10 1/4

EJERCICIO 6B-6/EXERCISE 6B-6, pages 32-33

1. 3 5/8
2. 3 7/9
3. 1/6
4. 9/12 = 3/4
5. 2 4/5
6. 23 1/7
7. 3 5/8
8. 15 7/10
9. 5 2/5
10. 20 1/15
11. 3/4
12. 3 9/16

EJERCICIO 6B-7/EXERCISE 6B-7, pages 38-39

1. 4 10/12 = 4 5/6
2. 4 7/9
3. 11 12/14 = 11 6/7
4. 2 5/10 = 2 1/2
5. 3 2/7
6. 2 4/12 = 2 1/3
7. 7 6/8 = 7 3/4
8. 1 3/5
9. 1 6/8 = 1 3/4
10. 3 2/3
11. 5 5/8
12. 2 12/15 = 2 4/5

EJERCICIO 6B-8/EXERCISE 6B-8, pages 44-45

1. 4 11/40
2. 3 29/36
3. 19/40
4. 1 9/12 = 1 3/4
5. 1 1/14
6. 2 1/24
7. 4 5/30 = 4 1/6
8. 31/40
9. 1 7/60
10. 2 31/36
11. 1 7/12
12. 2 9/10

EJERCICIO 6B-9/EXERCISE 6B-9, pages 46-47

1. 2/8 = 1/4
2. 5/12
3. 2/12 = 1/6
4. 2 71/80
5. 2 1/8
6. 1 5/6
7. 11/32
8. 21/35

REPASO 6B/REVIEW 6B, pages 48-51

1. 1/3
2. 2 1/2
3. 4 1/4
4. 2/3
5. 6 2/3
6. 10
7. 1/3
8. 12 1/2
9. 20 1/2
10. 11/24
11. 9 8/42 = 9 4/21
12. 6 11/72
13. 9 31/60
14. 12 7/18
15. 3 21/24 = 3 7/8
16. 4 2/3
17. 3/6 = 1/2
18. 4 1/12
19. 4 3/7
20. 1 4/10 = 1 2/5

REPASO 6B/REVIEW 6B (Cont.), pages 48-51

21. 11 7/12
22. 5 73/90
23. 2 17/36
24. 3 5/30 = 3 1/6
25. 13 1/3

CLAVE/ANSWER KEY

MODELOS Y ACTIVIDADES
PATTERNS AND ACTIVITIES

NIVEL 6B/LEVEL 6B

CLAVE / ANSWER KEY

MODELOS Y ACTIVIDADES/PATTERNS AND ACTIVITIES

NIVEL 6 / LEVEL 6

M6-1

4	△	1/4	4/4 = 1
3	△	1/4	3/4
5	△	1/4	5/4 = 1 1/4
2	△	1/4	2/4 = 1/2
6	△	1/4	6/4 = 1 1/2
7	△	1/4	7/4 = 1 3/4
8	△	1/4	8/4 = 2
11	△	1/4	11/4 = 2 3/4
12	△	1/4	12/4 = 3

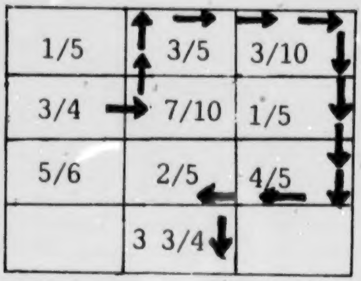
M6-

6	△	1/6	6/6 = 1
1	△	1/6	1/6
3	△	1/6	3/6 = 1/2
7	△	1/6	7/6 = 1 1/6
8	△	1/6	8/6 = 1 1/3
13	△	1/6	13/6 = 2 1/6
2	⏢	1/2	2/2 = 1
3	⏢	1/2	3/2 = 1 1/2
5	⏢	1/2	5/2 = 2 1/2

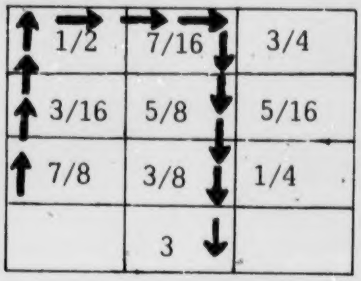
M6-3

3	△	1/3	3/3 = 1
2	△	1/3	2/3
4	△	1/3	4/3 = 1 1/3
5	△	1/3	5/3 = 1 2/3
6	△	1/3	6/3 = 2
7	△	1/3	7/3 = 2 1/3
8	△	1/3	8/3 = 2 2/3
9	△	1/3	9/3 = 3

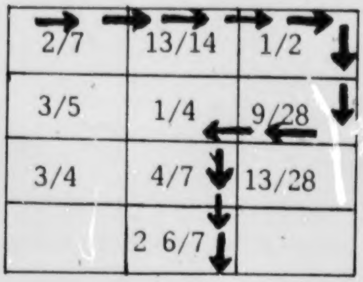
M6-8



1/5	3/5	3/10
3/4	7/10	1/5
5/6	2/5	4/5
	3 3/4	



1/2	7/16	3/4
3/16	5/8	5/16
7/8	3/8	1/4
	3	

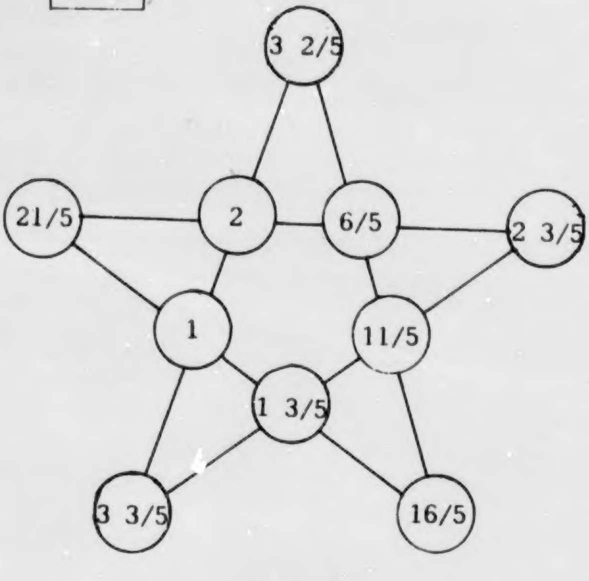


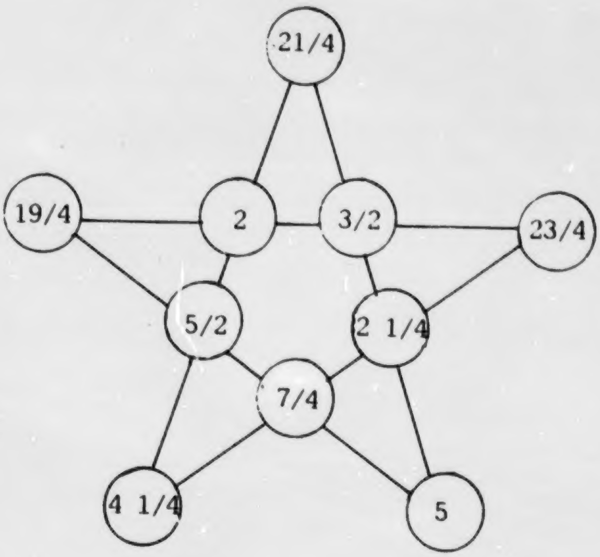
2/7	13/14	1/2
3/5	1/4	9/28
3/4	4/7	13/28
	2 6/7	

M6-9

1. $2.75
2. $1.75
3. $1.50

M6-10


3 2/5
21/5
2
6/5
2 3/5
1
11/5
1 3/5
3 3/5
16/5


21/4
19/4
2
3/2
23/4
5/2
2 1/4
7/4
4 1/4
5

CLAVE/ANSWER KEY

EXÁMENES/TESTS

NIVEL 6/LEVEL 6

CLAVE/ANSWER KEY

EXAMEN 1 / TEST 1

NIVEL 6 / LEVEL 6

1. 1/3
2. 2 1/4
3. 12 3/5
4. 5 2/3
5. 7/8
6. 7/12
7. 19/24
8. 8 1/6
9. 13 23/30
10. 12 1/21
11. 1 7/90
12. 17 11/24
13. 4/9
14. 7/12
15. 1/2
16. 4 1/12
17. 2 13/36
18. 2 7/10
19. 2 11/12
20. 3 3/7
21. 15 8/9
22. 14 19/20
23. 59/72
24. 6 3/16 libras - 6 3/16 pounds
25. 1 7/16 pulgadas - 1 7/16 inches

CLAVE/ANSWER KEY

EXAMEN 2 / TEST 2

NIVEL 6 / LEVEL 6

1. 5/9
2. 4 1/2
3. 3 1/4
4. 11
5. 7/16
6. 5/12
7. 23/24
8. 8 1/2
9. 22 1/15
10. 10 4/21
11. 1 11/90
12. 20 19/36
13. 5/9
14. 1/2
15. 5/7
16. 5 1/3
17. 2 17/36
18. 2 9/10
19. 6 11/12
20. 11 20/21
21. 5 5/7
22. 21 7/9
23. 2 1/72
24. 98 9/16 libras - 98 9/16 pounds
25. 37 1/15 pies - 37 1/5 feet

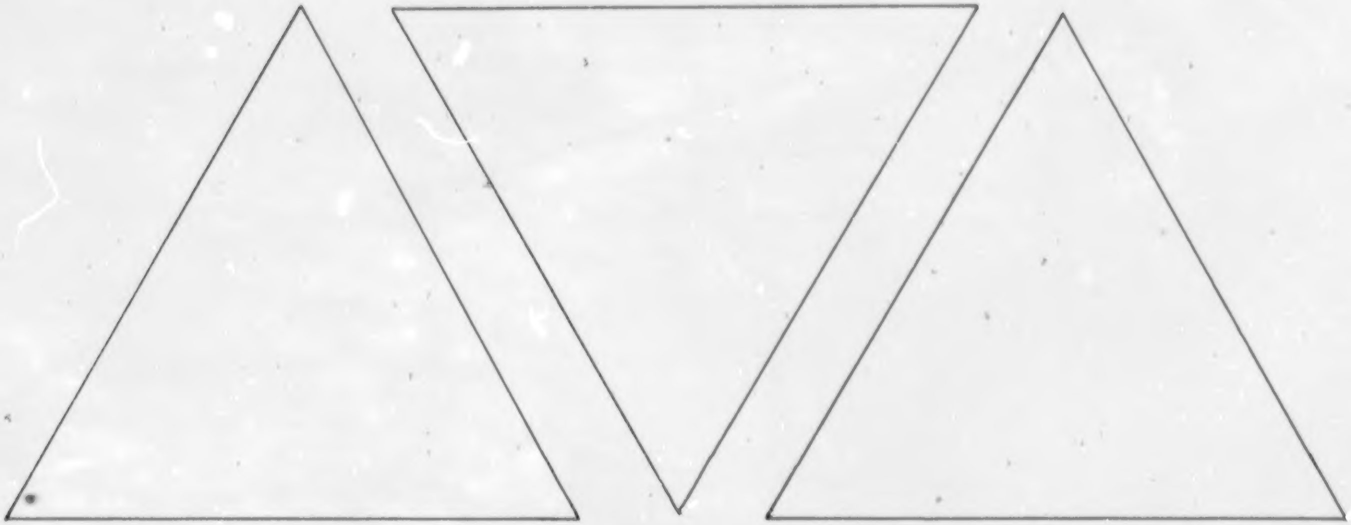
★ U.S. GOVERNMENT PRINTING OFFICE: 1979—672-870

PATTERNS AND ACTIVITIES
MODELOS Y ACTIVIDADES

NIVEL 6/LEVEL 6

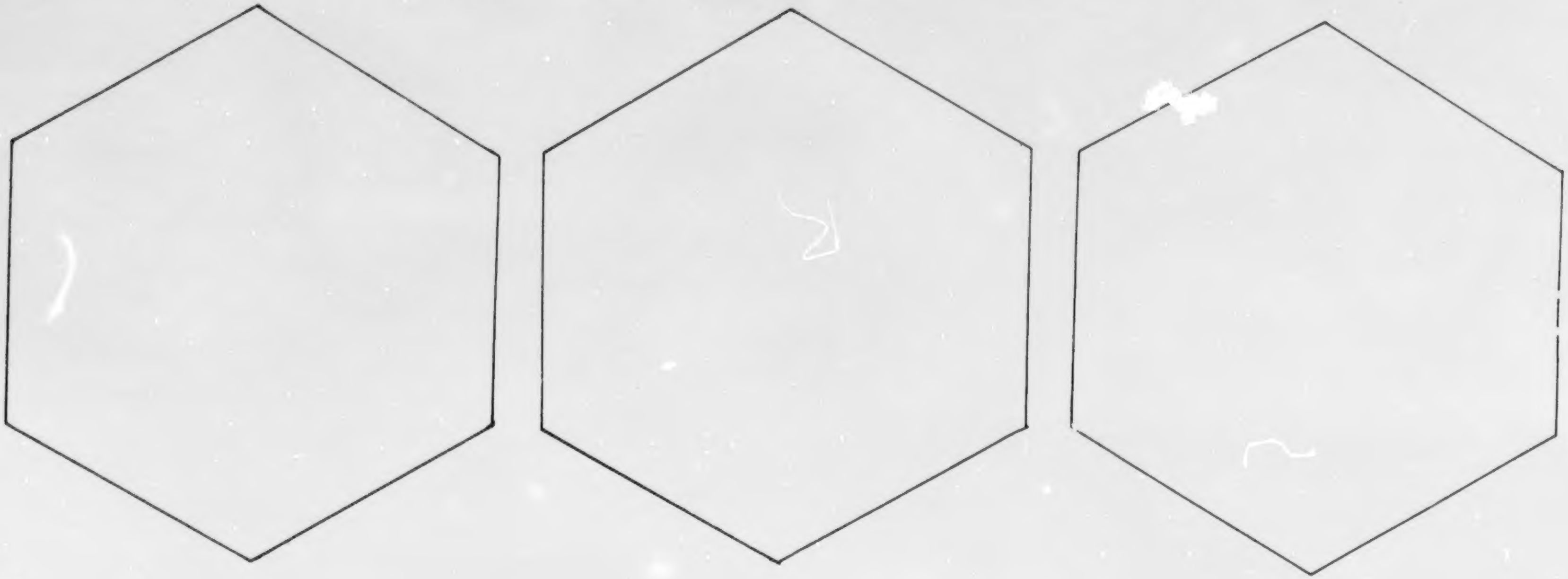
ROMPECABEZAS DE TRÍANGULOS

TRIANGLE PUZZLE



Números de piezas usadas Number of pieces used	Forma de una pieza Shape of piece	La fracción que designa una pieza. Fractional name of one piece	La fracción que designa todas las piezas usadas Fractional name of pieces used		
4	△	1/4	4/4	=	1
3	△	1/4			
5	△			=	
2	△				
6	△			=	
7	△			=	
8	△			=	
11	△			=	
12	△				

ROMPECABEZAS DE HEXAGONOS-HEXAGON PUZZLE



Números de piezas usadas Number of pieces used	Forma de una pieza Shape of piece	La fracción que designa una pieza Fractional name of one piece	La fracción que designa todas las piezas usadas Fractional name of all pieces used
6	△	1/6	6/6 = 1
1	△		1/6 =
3	△		=
7	△		=
8	△		=
13	△		=
2	⏢	1/2	=
3	⏢		=
5	⏢		=

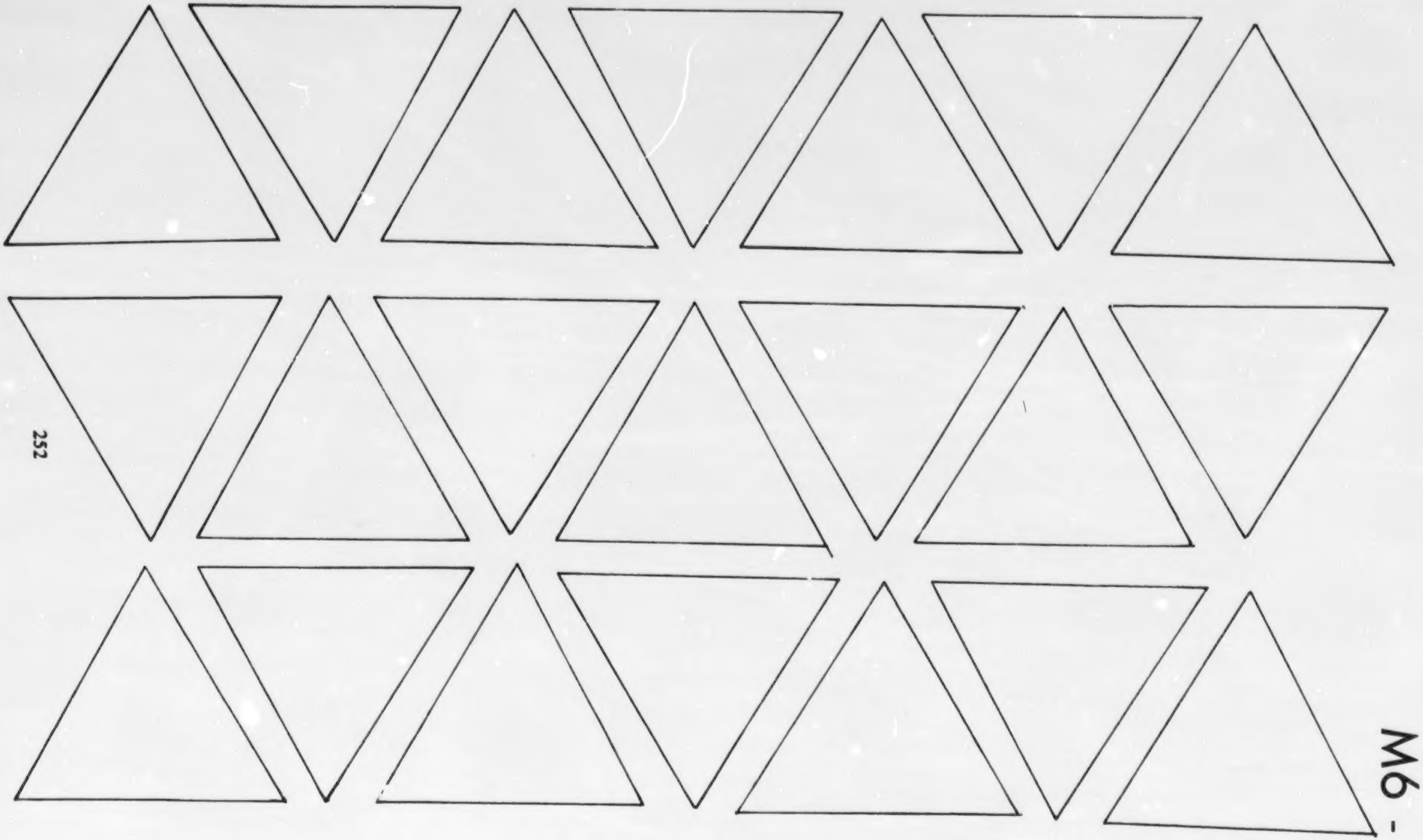
ROMPECABEZAS DE TRAPEZOIDES

TRABEZOID PUZZLE

Número de piezas usadas Number of pieces used	Forma de una pieza Shape of piece	La fracción que designa todas las piezas usadas Fractional name of all pieces used	La fracción que designa una pieza Fractional name of one piece
3	△	1/3	3/3 = 1
2	△	1/3	______
4	△	______	4/3 = ______
5	△	______	______ = ______
6	△	______	______ = ______
7	△	______	______ = ______
8	△	______	______ = ______
9	△	______	______ = ______

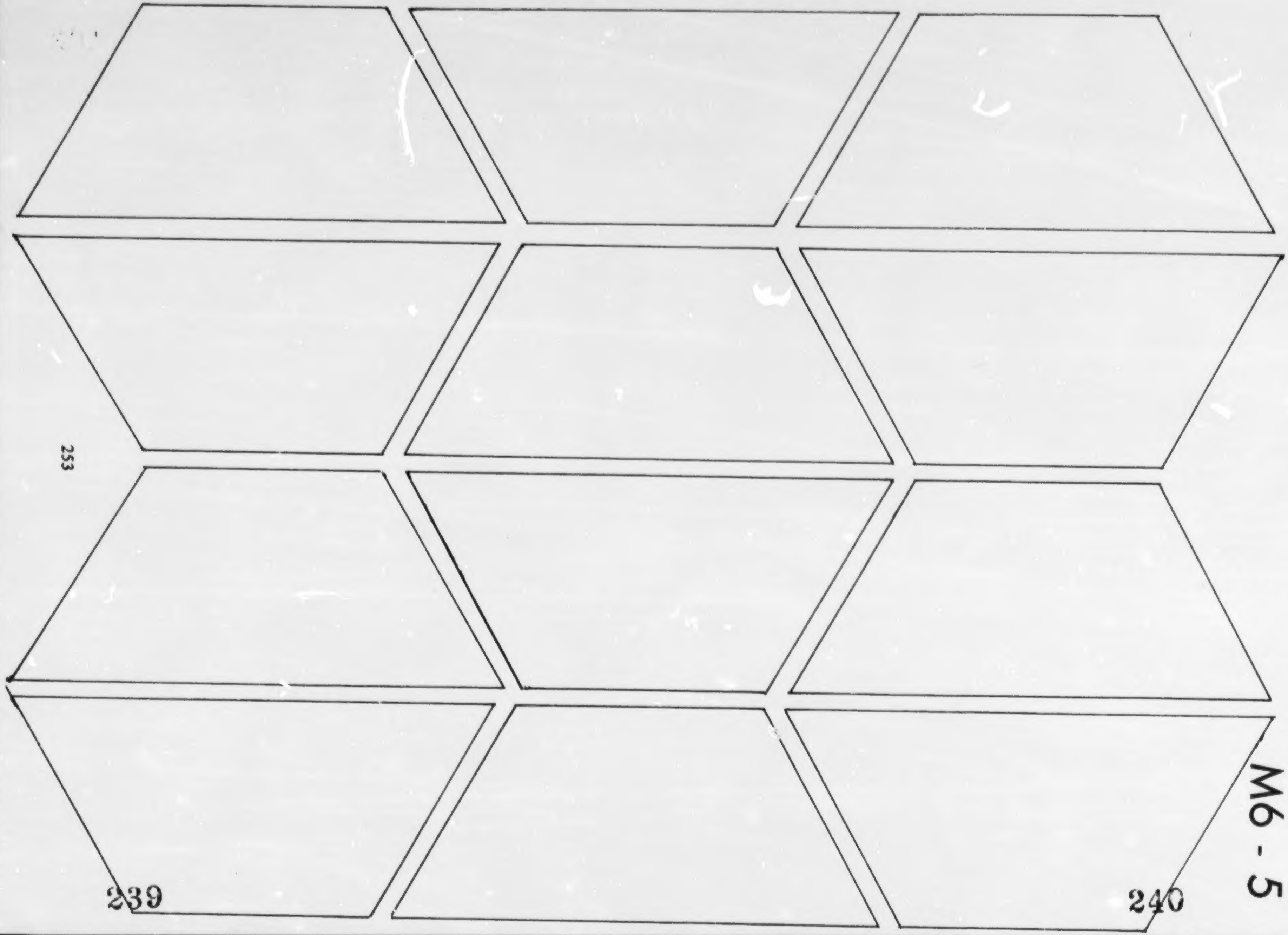
PIEZAS DE ROMPECABEZAS

PUZZLE PARTS



M6 - 4

PIEZAS DE ROMPECABEZAS - PUZZLE PARTS



M6 - 5

LOTERÍA DE FRACCIONES - FRACTION BINGO

OBJECT OF GAME

Practice in adding fractions having common denominators

NUMBER OF PLAYERS

Two to twelve

MATERIALS AS NEEDED

1. Twelve cards on which a fraction on a mixed number appears in each of eight of the nine squares.
2. Markers, such as bottle caps or disks, preferably large enough to cover the numbers on each square of the cards. (Eight markers per child)
3. Two sets of flash cards:

In the first set, some of the cards have illustrations and others have numerical examples of pairs of fractions with common denominators. The fractions are to be added.

In the second set, the cards have numerical examples of fractions and mixed numerals with common denominators to be added.

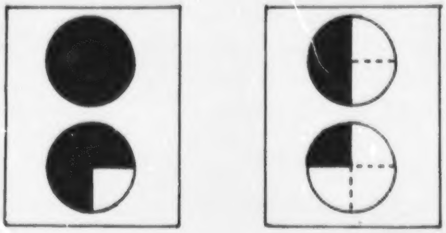
Answers are written on the back of the cards.

There must be one flash card for every square on every bingo card.

Examples:

2 1/2	1 1/3	1 1/4
3/4	Libre FREE	1
1 1/2	2/3	1 3/4

TARJETA-CARD



2/9
+5/9

TARJETAS RELÁMPAGO-PRIMER CONJUNTO
FLASH CARDS - FIRST SET

2 1/5
+8 3/5

6 1/8
+7 3/8

TARJETAS RELÁMPAGO-SEGUNDO CONJUNTO FLASH CARDS - SECOND SET

INSTRUCCIONES

El guía muestra una tarjeta relámpago en la que aparece una combinación de la suma, como 1 + 3/4. (El guía debe usar las ilustraciones primero, y después los numerales). Si el estudiante tiene la respuesta, la cubre con una ficha. El primero que cubra completamente su tarjeta, gana.

DIRECTIONS

The leader holds up a flash card on which appears an addition combination, such as 1 + 3/4. (The leader should use the illustrations first and then the numerals.) If the student has the answer on his card, he covers it with a marker. The first one to cover his card completely wins.

FACTORES - FACTORS

1		3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	2		2		2		2		2		2		2		2		2		2		2		2
		3			3			3			3			3			3			3			3
											12												

INSTRUCCIONES:

El la cuarta línea, empieza a contar en el cuadro 1 y oscurece cada cuarto cuadro a partir del 1.
En la quinta línea, empieza a contar en el cuadro 1 y oscurece cada quinto cuadro a partir el 1.
Sigue en la misma manera hasta que hayas completado la tabla.

DIRECTIONS:

On the fourth row, begin counting in Box 1 and shade every fourth box.
On the fifth row, begin counting in Box 1 and shade every fifth box.
Continue in the same way until you have completed the chart.

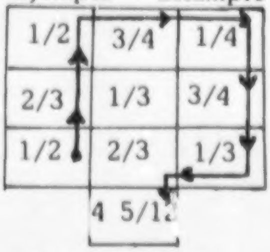
ENCUENTRA EL TESORO ESCONDIDO

Juan debe pasar a través de 3 laberintos para alcanzar el tesoro escondido. El puede empezar en cualquiera de los nueve cuadros de cada laberinto, pero para llegar al cuadro de salida, debe seguir un camino horizontal o vertical. El camino no puede ir diagonalmente ni puede retroceder ni cruzar a sí mismo. La suma de todos los cuadros que Juan atraviese debe de ser igual al número en el cuadro de salida. Traza una línea que representa el camino de Juan a través de cada laberinto.

FIND THE HIDDEN TREASURE

Juan must go along a trail in order to reach the hidden treasure. He may start in any one of the nine boxes of each maze, but in order to reach the "Exit" box, he must go along a horizontal or vertical trial. The trial cannot be diagonal and it cannot be itself. The sum of the numbers in all the boxes Juan passes through must equal the number in the "Exit" box.
Draw a line representing Juan's trial through each maze.

Ejemplo - Example



1/2	3/4	1/4
2/3	1/3	3/4
1/2	2/3	1/3
	4 5/12	

Salida - Exit

$$1/2 + 2/3 + 1/2 + 3/4 + 1/4 + 3/4 + 1/3 + 2/3 =$$

$$12/24 + 16/24 + 12/24 + 18/24 + 6/24 + 18/24 + 8/24 + 16/24 =$$

$$106/24 = 10/24 = 4\ 5/12$$

Empieza-Begin

1/5	3/5	3/10
3/4	7/10	1/5
5/6	2/5	4/5
	3 3/4	

Salida-Exit

1/2	7/16	3/4
3/16	5/8	5/16
7/8	3/8	1/4
Salida	3	Exit

2/7	13/14	1/2
3/5	1/4	9/28
3/4	4/7	13/28
	2 6/7	

Salida - Exit

LA RESTA CON REAGRUPACIÓN (PRESTAR)

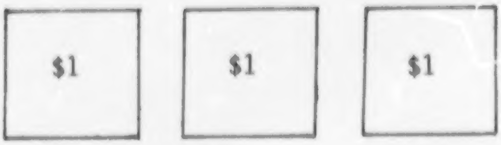
SUBTRACTION WITH BORROWING

1. Tienes tres billetes de un dólar cada uno. Si compras una Coca, sacándola de una máquina de sodas y pagando una peseta (una moneda de 25¢), ¿cuánto dinero te sobra?

   You have three one-dollar bills. If you buy a cola from a soda machine for a quarter, how much money will you have left?

PIENSA-THINK: 1 = ?/4

PROBLEMA DE RESTA
SUBRACTION PROBLEM



2. Tienes tres billetes de un dólar cada uno. Si compras un libro pagando por él un dólar y una peseta, ¿cuánto dinero te sobra?

   You have three one-dollar bills. If you have a book, paying one dollar and one quarter for it, how much money will you have left?

PROBLEMA DE RESTA
SUBTRACTION PROBLEM

$1 $1 $1

3. Tienes tres billetes de un dólar cada uno. Si compras pan dulce, pagando por él un dólar y dos pesetas, ¿cuánto dinero te sobra?

You have three one-dollar bills. If you buy some sweet rolls, paying one dollar and two quarters for them, how much money will you have left?

PROBLEMA DE RESTA-
SUBTRACTION PROBLEM

$1 $1 $1

ESTRELLAS MÁGICAS - MAGIC STARS

Instrucciones:

Escribe números dentro de los círculos de modo que la suma de los números de cada línea de la estrella mágica sea igual al número que se indica.

Directions:

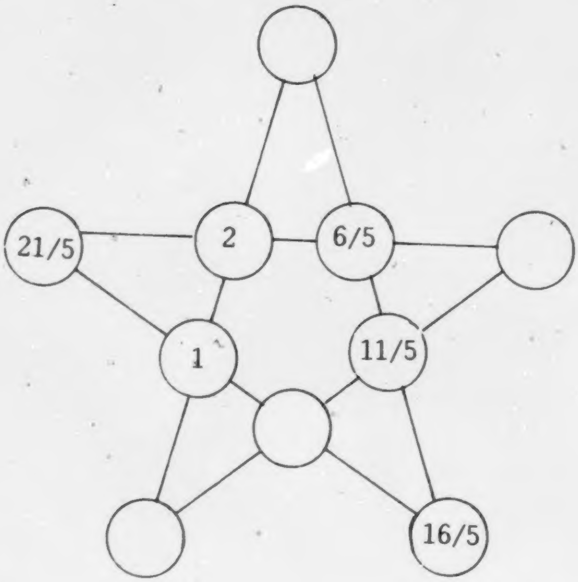
Write numbers in the circles so that the sum of the numbers on each line of the magic star is equal to the indicated number.

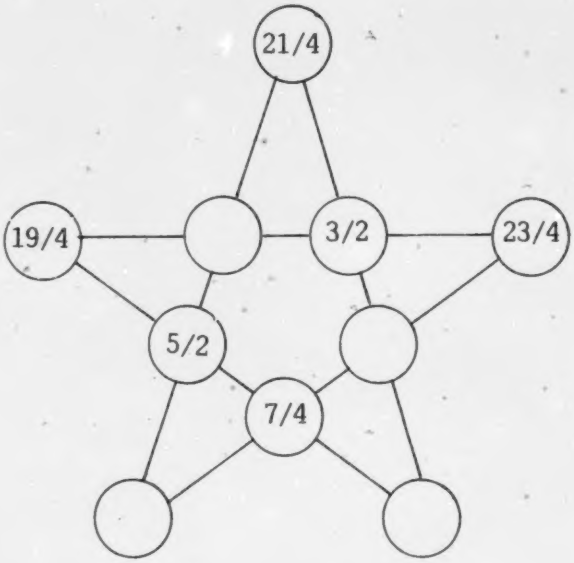
1. La suma de los números de cada línea debe de ser igual a 10.

   The sum of the numbers on each line should equal 10.

2. La suma de los números de cada línea debe ser igual a 14.

   The sum of the numbers on each line should equal 14.





243

EXÁMENES/TESTS

NIVEL 6/LEVEL 6

NIVEL 6/EXAMEN 1

Nombre__________________________ Fecha__________________________

Profesor__________________________ Período__________________________

Consejero__________________________ Calificación__________________________

Presenta por escrito todo tu trabajo:

Simplifica.

1. 25/75
2. 2 2/8
3. 12 6/10
4. 4 5/3

Suma y después simplifica las respuestas.

5. 3/8
+4/8

6. 1/3
+1/4

7. 5/12
+3/8

8. 4 5/6
+3 1/3

9. 6 1/2
4 1/10
+3 1/6

10. 3 5/6
+8 3/14

11. 4/9
+19/30

12. 7 5/12
3 5/24
+6 5/6

Resta y después simplifica las respuestas.

13. 8/9
-4/9

14. 3/4
-1/6

15. 13/14
- 6/14

16. 8 5/12
-4 1/3

17. 3 11/12
-1 5/9

18. 4 2/5
-1 7/10

19. 20 2/3
-17 3/4

20. 7
-3 4/7

21. 20 1/9
- 4 2/9

22. 18 19/20
- 4

23. 4 11/18
-3 19/24

24. Patricia tiene dos paquetes que pesan un total de 8 3/8 libras. Si un paquete pesa 2 3/16 libras, ¿cuánto pesa el otro?

25. Si el grosor de unas tablas mide lo siguiente 3/8 pulgada, 5/8 pulgada, 3/16 pulgada, y 1/4 pulgada, ¿cuál es el grosor de la pila de las cuatro tablas?

LEVEL 6/TEST 1

Name____________________ Date____________________

Teacher____________________ Period____________________

Advisor____________________ Score____________________

Show all work.

Simplify.

1. 25/75
2. 2 2/8
3. 12 6/10
4. 4 5/3

Add and then simplify the answers.

5. 3/8
+4/8

6. 1/3
+1/4

7. 5/12
+3/8

8. 4 5/6
+3 1/3

9. 6 1/2
4 1/10
+3 1/6

10. 3 5/6
+8 3/14

11. 4/9
+19/30

12. 7 5/12
3 5/24
+6 5/6

Subtract and then simplify the answers.

13. 8/9
-4/9

14. 3/4
-1/6

15. 13/14
- 6/14

16. 8 5/12
-4 1/3

17. 3 11/12
-1 5/9

18. 4 2/5
-1 7/10

19. 20 2/3
-17 3/4

20. 7
-3 4/7

21. 20 1/9
- 4 2/9

22. 18 19/20
- 4

23. 4 11/18
-3 19/24

24. Pat has two packages that weigh a total of 8 3/8 pounds. If one package weighs 2 3/16 pounds, how much does the other package weigh?

25. If boards have thicknesses of 3/8 inch, 5/8 inch, 3/16 inch, and 1/4 inch, what is the thickness of a stack of the four boards?

NIVEL 6/EXAMEN 2

Nombre____________________ Fecha____________________

Profesor____________________ Período____________________

Consejero____________________ Calificación____________________

Presenta por escrito todo tu trabajo.

Simplifica:

1. 25/45
2. 4 5/10
3. 2 5/4
4. 9 6/3

Suma y después simplifica las respuesta.

5. 3/16
+4/16

6. 1/4
+1/6

7. 7/12
+3/8

8. 4 5/6
+3 2/3

9. 7 1/2
10 2/5
+ 4 1/6

10. 3 5/14
+6 5/6

11. 5/9
+17/30

12. 6 5/12
7 5/18
+6 5/6

Resta y después simplifica las respuests.

13. 8/9
-3/9

14. 2/3
-1/6

15. 13/14
- 3/14

16. 8 7/12
-3 1/4

17. 3 11/12
-1 4/9

18. 4 3/5
-1 7/10

19. 24 2/3
-17 3/4

20. 15 20/21
- 4

21. 8
-2 2/7

22. 43 2/9
-21 4/9

23. 4 13/18
-2 17/24

24. Alicia y Celia pesan 205 3/4 libras entre las dos. Si Alicia pesa 107 3/16 lbs., ¿cuánto pesa Celia?

25. Guillermo puede brincar 17 2/5 pies y Jaime puede brincar 19 2/3 pies. ¿Cuánto pueden brincar entre los dos al sumar las distancias?

LEVEL 6/TEST 2

Name________________ Date________________

Teacher________________ Period________________

Advisor________________ Score________________

Show all work.

Simplify.

1. 25/45
3. 2 5/4
2. 4 5/10
4. 9 6/3

Add and then simplify the answers.

5. 3/16
+4/16

6. 1/4
+1/6

7. 7/12
+3/8

8. 4 5/6
+3 2/3

9. 7 1/2
10 2/5
4 1/6

10. 3 5/14
+6 5/6

11. 5/9
+17/30

12. 6 5/2
7 5/18
+6 5/6

Subtract and then simplify the answers.

13. 8/9
-3/9

14. 2/3
-1/6

15. 13/14
- 3/14

16. 8 7/12
-3 1/4

17. 3 11/12
-1 4/9

18. 4 3/5
-1 7/10

19. 24 2/3
-17 3/4

20. 15 20/21
- 4

21. 8
-2 2/7

22. 43 2/9
-21 4/9

23. 4 13/18
-2 17/24

24. Sue and Kim weigh 205 3/4 lbs. together. If Sue weighs 107 3/16 lbs., how much does Kim weigh?

25. Bill can jump 17 2/5 ft., and Jim can jump 19 2/3 ft. How much distance do their jumps total?

DACBE

National Dissemination and Assessment Center for Bilingual Education

Please help us improve it!

This book is the result of the efforts of many people working at the Bilingual Materials Development Center, The Dissemination and Assessment Center for Bilingual Education, Bilingual Resource Center, local bilingual projects and bilingual teachers. This book has gone through a careful process of pilot testing and revision in order to give you the highest quality material possible. It is designed to meet your needs and those of your bilingual students.

The book will be revised on the second printing, in light of the feedback you and other teachers provide. These revisions will be based on your responses to the questionnaires inserted in this first edition.

The questionnaire covers the areas of Organization and Quality, Implementation, Content and tests. Please answer the questions ad detailed as possible, providing comments and suggestions when applicable. If necessary add extra pages.

Once you have completed the questionnaire, tear the pages out of the book, attach any additional pages, fold them with the DACBE address on the outside and mail them (no postage is necessary).

WE NEED HELP FROM YOUR STUDENTS, TOO!

Each of the students' books has two questionnaires inserted. One is in English and one is in Spanish. Please encourage your students to complete one, English or Spanish, whichever they prefer. You could make this a class project, getting the students to analyze the books and state what they like or dislike about them.

Thank you for your cooperation in this endeavor. Your help is essential for the improvement of bilingual education.

7703 North Lamar Austin, Texas 78752 458-9131

I. Organization & Quality

1. How well does the introduction in the teacher's guide explain how to use these materials?

________1 very well, no improvements are needed

________2 acceptable, moderate improvements could be made

________3 unacceptable, major improvements are needed

If improvements are needed, please describe:

____

____

____

____

2. How well do the teacher's and student's editions correspond?

________1 very well, class can be conducted with only the teacher's edition

________2 adequate, occasional reference to student's edition is needed

________3 inadequate, continuous reference to student's edition is needed

3. Did the lesson instructions provide sufficient information to implement the lesson?

________1 almost always

________2 sometimes

________3 almost never

4. How useful was the glossary in the student's book?

________1 very useful

________2 somewhat useful

________3 not very useful

II. Implementation

1. How difficult were these materials to use?

________1 difficult

________2 average

________3 easy

Comments: ____

____

2. How did you use these materials?

________1 group instruction

________2 individual instruction

________3 both, group and individual

Comments: ____

____

3. Was the number of exercises adequate for implementing the lessons?

________1 yes

________2 no

Comments: ____

____

4. Did you have to use additional materials to implement the lessons?

________1 yes

________2 no

Comments. ____

____

5. Are the materials adaptable for use with students of different ability levels?

________1 yes

________2 no

Comments: ____

____

6. How did you use these materials in your teaching?

________1 basic text

________2 supplementary

Comments: ____

____

III. Content

1. How do you rate the content of these materials in comparison with other materials?

________1 excellent

________2 above average

________3 average

________4 below average

________5 poor

Comments: ____

____

2. Did the students benefit from using these materials?

________1 yes

________2 no -- Why not? ______________________________

____

3. Did the students appear to be interested in the materials?

________1 yes

________2 no

Comments: ____

____

4. Is the reading level of the student books appropriate for most of the students in your class?

________1 too difficult

________2 about right

________3 too easy

Comments: ____

____

5. Rate the difficulty level of the conceptual content of these materials.

________1 much too difficult

________2 too difficult

________3 just about right

________4 too easy

________5 much too easy

Comments: ____

____

6. Do the materials cover the main topics of the subject curriculum?

________1 yes

________2 no--Which topics need to be included? ______________________

____

7. Were the main concepts of each lesson clear to the students?

________1 yes, with no explanation from the teachers

________2 yes, with minor explanation from the teacher

________3 yes, with major explanation from the teacher

________4 no

Comments: ____

____

8. Did the activities or exercises lead to concept mastery?

________1 yes

________2 no

Comments: ____

____

9. Did the sequence of topics facilitate learning?

________1 yes

________2 no

Comments: ____

____

10. Was the learning sequence well placed?

________1 too fast

________2 about right

________3 too slow

Comments: ____

____

11. Do the activities lead to achieving the behavioral objectives given in each unit?

________1 always

________2 most of the time

________3 sometimes

________4 not very often

________5 never

12. Were the behavioral objectives useful as a guide to your classroom presentation?

________1 yes

________2 no--Why not? ______________________________________

____

13. Were the criteria specified by the behavioral objectives appropriate for determining mastery of the content?

________1 yes

________2 no--Why not? ______________________________________

____

14. Was the number of behavioral objectives per lesson appropriate?

________1 yes

________2 no--Why not? ______________________________________

____

15. How much did these materials help the Spanish speaking students improve their English?

________1 to a great extent

________2 to some extent

________3 to a small extent

________4 not at all

________5 not applicable

16. How much did these materials help the Spanish speaking students improve their Spanish?

_______1 to a great extent
_______2 to some extent
_______3 to a small extent
_______4 not at all
_______5 not applicable

17. How would you rate the Spanish competency level of these materials?

_______1 beginner (limited to no experience with Spanish)
_______2 intermediate (experience with Spanish but not fluent)
_______3 advanced (fluent in Spanish)

Comments: ____
____

18. Did these materials use Spanish that is understood by most Spanish speakers?

_______1 yes
_______2 no

Comments: ____
____

IV. Tests

1. Would it have been desirable to have a placement test for these materials?

_______1 yes
_______2 no

Comments: ____
____

2: Were the pretests helpful?

_______1 yes
_______2 no

Comments: ____
____

3. Were the posttests helpful?

_______1 yes
_______2 no

Comments: ____
____

4. What was the difficulty level of most of the tests?

________1 too difficult

________2 moderately difficult

________3 just about right

________4 moderately easy

________5 too easy

Comments: ____

____

5. Were the test items clearly stated?

________1 yes

________2 no

Comments: ____

____

6. Were there any mistakes in the answer keys?

________1 frequently

________2 occasionally

________3 never

Comments: ____

____

7. Was the length of most tests appropriate?

________1 much too long

________2 too long

________3 just about right

________4 too short

________5 much too short

8. Were the tests given at appropriate intervals?

________1 too frequently

________2 about right

________3 too infrequently

9. Are the test items representative of the content of the lessons?

________1 yes

________2 no

Comments: ____

____

If you have any other concern, comment or suggestion about the entire pilot testing procedure, the materials, student's reactions, etc., please provide them on a separate page.

Comments

If you have any other concern, comment or suggestion about the entire pilot testing procedure, the materials, student's reactions, etc., please provide them here:

FIRST CLASS
PERMIT NO. 3937
AUSTIN, TEXAS

BUSINESS REPLY MAIL
NO POSTAGE NECESSARY IF MAILED IN THE U.S.

POSTAGE WILL BE PAID BY

DISSEMINATION AND ASSESSMENT CENTER FOR BILINGUAL EDUCATION
7703 North Lamar Boulevard
Austin, Texas 78752